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Amended RCRA Facility Investigation Report
SWMU 360

Marine Corps Base Camp Lejeune
Jacksonville, North Carolina

Prepared for

Department of the Navy
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Mid-Atlantic
Norfolk, Virginia

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Navy Clean

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Prepared by

Certification Page for Amended RFI Report – SWMU 360

I, Louise Palmer, certify that this report has been prepared under my direct supervision. The data and information are, to the best of my knowledge, accurate and correct, and the report has been prepared in accordance with current standards of practice for engineering.

North Carolina

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Acronyms and Abbreviations

ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylene
cis-1,2-DCE	cis-1,2-dichloroethene
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	contract laboratory program
COC	chain of custody
COC	contaminant of concern
COPC	chemical of potential concern
CSI	Confirmatory Sampling Investigation
CTO	Contract Task Order
CVOC	chlorinated volatile organic compound
DCE	dichlorethene, cis-1,2-dichlorethene
DPT	direct push technology
EPA	U.S. Environmental Protection Agency
ERA	ecological risk assessment
FID	flame ionization detector
HHRA	human health risk assessment
IR	Installation Restoration
LSA	Limited Site Assessment
MCB	Marine Corps Base
MCL	maximum contaminant level
msl	mean sea level
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
PCE	perchloroethylene or tetrachloroethylene
PID	Photo-ionization detector
PRG	preliminary remediation goal
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RAGS	Risk Assessment Guidance for Superfund

RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SSLs	soil screening levels
SOPs	standard operating procedures
SVOCS	semivolatile organic compounds
SWMU	solid waste management unit
TCE	trichloroethene
TOC	total organic content
TOD	total oxidant demand
UST	underground storage tank
VOC	volatile organic compound
WQP	water quality parameter
µg/kg	micrograms per kilogram or parts per billion in solid
µg/L	micrograms per liter or parts per billion in liquid

Executive Summary

Introduction

This report serves as an amendment to the investigation procedures and results of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at Solid Waste Management Unit (SWMU) 360 at Marine Corps Base (MCB) Camp Lejeune, North Carolina (the Base). SWMU 360 was a former 300 gallon waste oil underground storage tank (UST) near Building 1817. The UST was removed in July of 1997. The results of a Limited Site Assessment revealed chlorinated solvents in soil and groundwater, and the site was transferred to the RCRA program. A Confirmatory Sampling Investigation (CSI) was conducted, and chemicals of potential concern (COPCs) concentrations were compared to screening criteria. Because some of the COPC concentrations exceeded the screening criteria, an RFI was recommended at the conclusion of the CSI.

A RFI Report for the SWMU was completed in October 2005 by Baker Environmental, Inc. The RFI concluded that subsurface soil contamination of tetrachloroethene (PCE) is evident at the SWMU. The soil contamination is limited to the area in the northeast corner of the compound associated with Building 1817. PCE and trichloroethene (TCE) were detected in groundwater samples collected around SWMU 360. Groundwater sampling during the 2005 RFI defined the horizontal side gradient extent of this plume (southwest and northeast). However, the down gradient, up gradient, and the vertical extent of groundwater contamination were not defined.

The Human Health Risk Assessment (HHRA) for the 2005 RFI concluded that the PCE and TCE in groundwater exhibited a risk to human health for future adult and child residents. The ecological risk assessment determined that ecological risk is not likely at the SWMU based on a negligible terrestrial habitat that does not warrant ecological evaluation and the fact that no aquatic habitat is present on or near the study area (Baker, 2005).

Supplemental Investigation Activities

A number of data gaps were identified at the completion of the 2005 RFI. Therefore, a second phase of RFI activities was deemed necessary. This report addresses the second phase of work.

To address the data gaps, the amended RFI activities included:

- Direct push technology (DPT) soil sampling for analysis of volatile organic compounds (VOCs)
- DPT groundwater sampling for analysis of VOCs
- Installation of six permanent monitoring wells
- Groundwater sampling of existing and newly installed monitoring wells
- Geotechnical soil testing for vertical permeability and grain size analysis
- Slug testing six monitoring wells

Analytical results from the additional field activities at SWMU 360 show PCE and TCE, both VOCs associated with degreasing and metal cleaning operations, and their daughter products cis-1, 2-dichloroethene (DCE) and vinyl chloride in the soil and groundwater.

The primary goal of this amended report is to discuss results and conclusions from the additional field activities conducted at SWMU 360 as recommended in the 2005 RFI report.

Nature and Extent of Contamination

The primary contaminants of concern at SWMU 360 are PCE in the soil, as well as PCE and TCE in the groundwater. Additional groundwater contaminants consist of cis-1,2-DCE, vinyl chloride, and petroleum constituents. The petroleum constituents were located in the areas of highest concentrations of PCE and TCE.

The highest concentrations and distribution of the PCE, TCE, and degradation products tend to coincide with each other. Maximum concentrations were detected in wells and DPT borings located near the former UST.

Four VOCs: PCE, TCE, cis-1,2-DCE, and vinyl chloride were detected in the both shallow and intermediate groundwater at concentrations that exceeded North Carolina Drinking Water (NCAC 2L) standards for tap water. The maximum groundwater concentrations, and most other exceedances of regulatory standards, were found in samples collected from the immediate vicinity of Building 1817, specifically in shallow monitoring well 1817MW01, which was installed in the former UST basin. PCE was detected at a maximum concentration of 3,100 µg/kg in 1817MW01.

The plume of chlorinated VOCs is long and narrow. It is estimated to be approximately 250 feet in width and the length is undefined. Monitoring well SWMU360-MW08, which is located approximately 370 feet upgradient of the former UST basin contains exceedances of the NCAC 2L groundwater quality standards for TCE and vinyl chloride. This indicates the presence of an upgradient source for a portion of the contaminants. This amended RFI is not intended to evaluate the upgradient extent of contamination; rather to evaluate contamination resulting from operations at the SWMU 360 source.

Conclusions and Recommendations

Adequate on-site characterization and delineation of soil contamination at SWMU 360 has been accomplished to the extent necessary to determine the nature and extent of soil contamination. Impacted soil is confined to an irregularly shaped area of approximately 165 ft from east to west by 205 ft north to south. The impacted soil is at and immediately surrounding the former UST area and extends underneath the southeastern end of Building 1817. PCE contamination extends to the groundwater table, approximately 20 feet below the ground surface (bgs).

Groundwater contamination has not been adequately characterized in the northwest and southeast directions in either the shallow or intermediate aquifer zones. Additional assessment is required to determine the horizontal extent of groundwater contamination in

the northwest (upgradient) and southeast (downgradient) directions, although it may be assumed that up gradient contamination is a result of a source other than SWMU 360.

Additional assessment is also required to complete the vertical delineation of the groundwater contaminant plume. Exceedances of the NCAC 2L groundwater quality standards were reported in intermediate-zone monitoring wells at the source area, and at SWMU360-MW10IW, located approximately 600 feet downgradient (southeast) of the source area. The wells are screened at a depth of 40 to 45 feet bgs.

The HHRA was reviewed in light of the new data, and the conclusion that the site poses unacceptable risk from residential exposure to site groundwater is still valid. There is no current risk to military personnel.

1.0 Introduction

This document presents the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) amended Report for Solid Waste Management Unit (SWMU) 360 at Marine Corps Base (MCB) Camp Lejeune, North Carolina (the Base). The site location is shown in **Figures 1-1** and **1-2**. This document has been prepared by CH2M HILL, Inc. under Contract Task Order (CTO) 100 of the Department of the Navy's Comprehensive Long-Term Environmental Action Navy (CLEAN) Program.

1.1 Purpose and Objectives of Amended RFI

An RFI was conducted at SWMU 360 and reported in *Final SWMU 360 RCRA Facility Investigation Report* (Baker, 2005). The purpose of this amended RFI is to fill some of the data gaps identified by the 2005 RFI. The objectives of the amended RFI at SWMU 360 are to:

- Define the vertical and horizontal extent and vertical variation of the chlorinated volatile organic compounds (VOCs) in groundwater and soil.
- Further evaluate aquifer characteristics such as hydraulic conductivity through slug tests and geotechnical analysis of soil.
- Better define the hydrogeologic characteristics of the site, including groundwater flow direction and velocity.

The RFI activities included direct-push (Geoprobe) soil and groundwater sampling, installation and sampling of monitoring wells, slug testing, performing geotechnical analysis of the soil, and analyzing soil and groundwater for chemicals of potential concern (COPCs).

1.2 SWMU Description

SWMU 360 was a former 300-gallon waste oil underground storage tank (UST) near Building 1817. The UST was removed by Clean East Associates, Inc. in July 1997. Building 1817 is located in the Hadnot Point Industrial Area between Duncan Street and "O" Street and one block north east of McHugh Boulevard or the former Main Service Road (**Figure 1-3**). The 8th Communication Battalion operates Building 1817 as the Hazardous Materials Consolidation Center.

The actual SWMU is located in the eastern portion of the compound, which is being used as a temporary staging area for batteries, refrigeration units and other used equipment prior to disposal and/or reutilization. The entire compound is fenced in and has limited access. A new wash pad has been built near the area of the UST excavation and is utilized by the Marine Units occupying the facility.

1.3 Previous Investigations

1.3.1 UST Removal and LSA

The UST was removed in July of 1997 and confirmatory samples were collected by Clean East Associates, Inc. following UST closure protocol. Confirmatory samples confirmed that a petroleum release had occurred at the site. In December 1997 Catlin/Law Engineers and Scientists performed a limited site assessment (LSA), which included installing monitoring well 1817MW01 within the former UST excavation. Upon discovery of elevated concentrations of chlorinated compounds in the soil and groundwater, the site was removed from the UST program and transferred to the RCRA program.

1.3.2 CSI Investigation

In 2002 a Confirmatory Sampling Investigation (CSI) was conducted under the RCRA program (Baker, 2005). The CSI included surface and subsurface soil sampling and the installation and sampling of four temporary wells.

The CSI identified the following COPCs in soil:

- VOCs - bromoform, methylene chloride, and tetrachloroethene (PCE)
- Pesticides - dieldrin
- Metals - arsenic

The following COPCs were identified in groundwater at SWMU 360:

- VOCs – cis-1,2-dichloroethene (DCE), PCE, and trichloroethene (TCE)
- Semivolatile organic compounds (SVOCs) – 4-methylphenol and acetophenone
- Pesticides – DDE, DDT, aldrin, alpha-chlordane, gamma-chlordane, heptachlor, heptachlor epoxide, alpha-BHC, and beta-BHC

Petroleum hydrocarbons were detected in soil and groundwater samples at relatively low concentrations, less than health-based comparison criteria, and therefore were not identified as COPCs.

1.3.3 RFI Investigation

An RFI for the SWMU was completed in October 2005 by Baker Environmental, Inc. (Baker). The RFI consisted of soil borings, collection of surface and subsurface soil samples, groundwater sample collection via Geoprobe Screen Point Sampler, and installation of permanent monitoring wells. Sampling was conducted in 2003. A summary of analytical results from the 2005 RFI Report is included in **Appendix A**, along with a map showing sample locations.

Based on the RFI, subsurface soil contamination of PCE is evident at the SWMU. The soil contamination is limited to the area in the southeast end of the Building 1817 compound, near the former UST location. The maximum concentration of PCE in soil was measured at 118 micrograms per kilogram (µg/kg). PCE degradation products were not commonly detected in the soil, indicating that natural attenuation was not occurring at a high rate

within the vadose zone at this site. Previous detections of pesticides in the soil from the CSI were not substantiated during the RFI sampling. Likewise, arsenic was detected in soil within the upper 5 feet of subsurface soil at concentrations generally lower than comparison criteria.

PCE and TCE were detected in groundwater samples collected around SWMU 360. Pesticides and SVOCs identified during the CSI were not detected in groundwater during the RFI, and it was concluded that previous detections of those COPCs had likely resulted from turbidity in the CSI groundwater samples.

The maximum concentrations of PCE and its degradation products in groundwater were detected from samples collected within the original UST well, 1817-MW01. In the 2003 samples, PCE was detected at a concentration of 5,100 micrograms per liter (µg/L), and TCE was detected at 460 µg/L. The PCE plume extended downgradient from the UST location, dissipating to less than 20 µg/L approximately 500 feet southeast of the SWMU. Low levels of TCE, on the order of 10 µg/L, were detected upgradient of the SWMU. The down gradient, up gradient, and the vertical extent of groundwater contamination were not defined during the RFI.

1.3.3.1 Human Health Risk Assessment

A baseline Human Health Risk Assessment (HHRA) was completed as part of the 2005 RFI for SWMU 360 to evaluate if unacceptable risks may be associated with potential exposure to existing conditions at the site. The HHRA indicated no unacceptable risks or hazard levels for current military personnel or future construction workers. However, the detection of PCE, TCE and heptachlor epoxide in groundwater (from CSI data) exhibited a risk to human health for future adult and child residents. This risk is based on contact with groundwater and the possibility that the Base may become a future residential area.

1.3.3.2 Ecological Risk Assessment

An Ecological Risk Assessment (ERA) was also completed as part of the 2005 Baker RFI in order to evaluate the likelihood that adverse ecological effects would occur or are occurring as a result of exposure to one or more physical or chemical stressors. The assessment evaluated the potential effects of chemicals on terrestrial and aquatic receptors (e.g., flora and fauna) and their habitats; including the consideration of protected species and sensitive or critical habitats. It also identified particular chemical stressors that may cause adverse effects. The ERA determined that ecological risk is not likely at the SWMU based on a negligible terrestrial habitat that does not warrant ecological evaluation and the fact that no aquatic habitat is present on or near the study area.

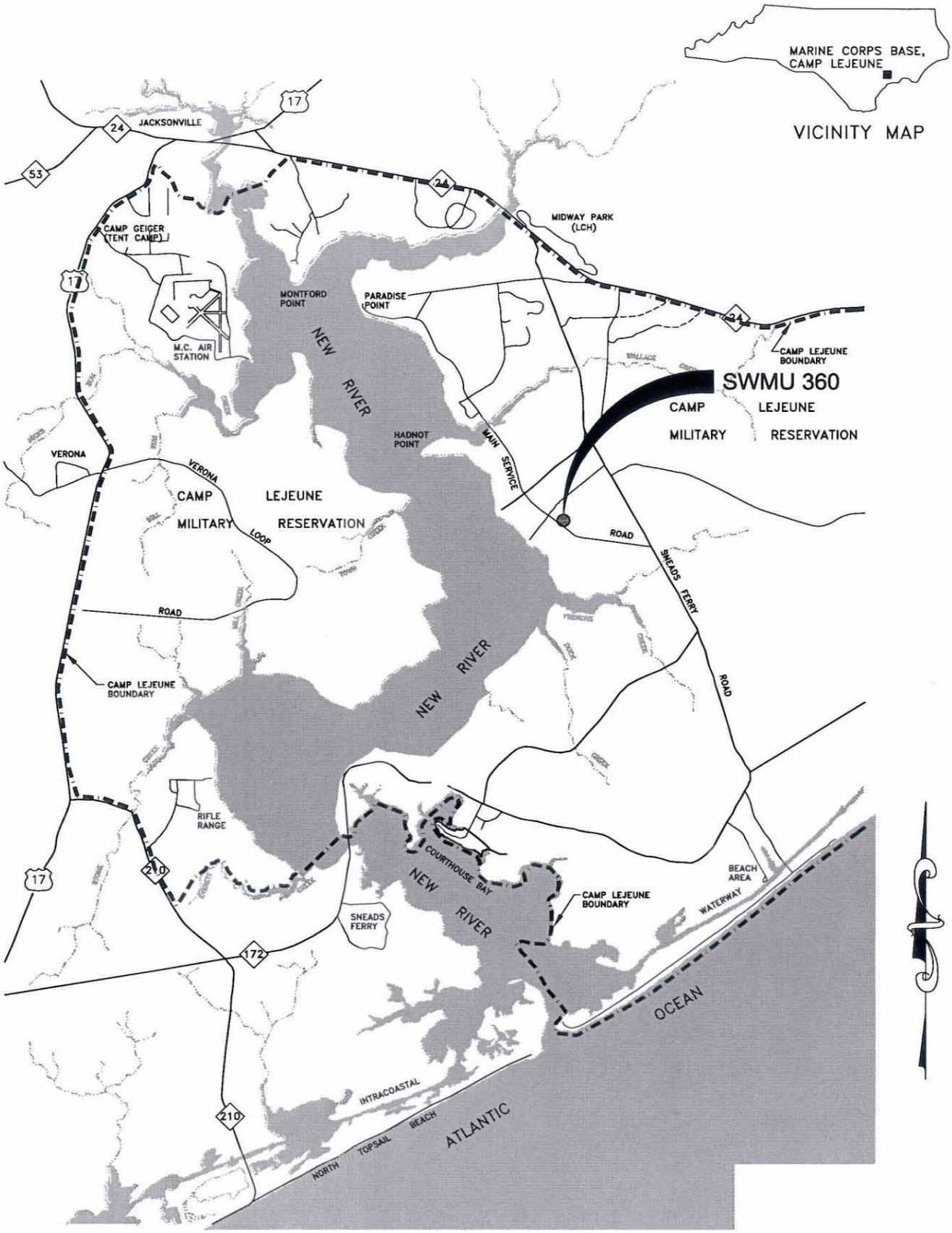

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FIGURE 1–1
MCB CAMP LEJEUNE GENERAL LOCATION MAP
AMENDED RCRA FACILITY INVESTIGATION (RFI)
SMWU 360 CTO –0100
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

SOURCE: MCB CAMP LEJEUNE, 2000.

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Legend
- Buildings
- Road Line

N
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0 350 700
Feet

Figure 1-2
SWMU 360 Location Map
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

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Legend
- Waste Oil UST
- Buildings
- Road Line
- Streams

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0 50 100 200 300
Feet

Figure 1-3
Former UST Location SWMU 360
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

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2.0 Amended RFI Field Activities

This section presents a summary of activities conducted for the Amended RFI for SWMU 360. All amended RFI field activities were conducted in accordance with Standard Operating Procedures (SOPs) outlined in the *Final Site Specific Field Sampling and Analysis Plan Records Search and RCRA Facility Investigation Addendum SWMU 360, Marine Corps Base Camp Lejeune, North Carolina* by CH2M HILL dated November 2005. Where the RFI procedures differed from those presented in the project plans, they are identified here.

The scope of the Amended RFI activities consisted of:

- Direct-push (Geoprobe®) groundwater and soil sampling
- Installation and development of 6 new monitoring wells
- Groundwater sampling from all site monitoring wells
- Geotechnical analysis for the determination of vertical permeability and grain size
- Hydraulic conductivity testing of groundwater in six monitoring wells
- Surveying of monitoring wells and direct push technology (DPT) sampling points

2.1 Direct Push Technology Sampling

2.1.1 Soil Investigation

Five additional DPT soil borings (SWMU360-IS34, SWMU360-IS35, SWMU360-IS36, SWMU360-IS37, and SWMU360-IS45) were installed within the vicinity of monitoring well 1817-MW01 to further define the PCE impacted soils at SWMU 360 (**Figure 2-1**). Continuous soil samples were collected from the soil borings to characterize lithology and screen for the presence of VOCs. Near-surface soil, 1 to 3 feet below ground surface (bgs) and deeper subsurface soils with the highest flame ionization detector (FID) or photo-ionization detector (PID) readings were submitted to the laboratory for VOC analysis. Each boring was advanced to the water table at a depth of approximately 20 ft bgs. Soil sampling procedures are described in the Master FSAP (CH2M HILL, June 2004). The soil samples collected from the five borings were submitted to a fixed base laboratory for analysis of VOCs by United States Environmental Protection Agency (US EPA) Method SW846-8260.

The soil investigation also included the collection of soil samples for total organic content (TOC) and total oxidant demand (TOD) analyses. During the DPT activities, soil samples were collected with acetate liner sleeves from four borings (SWMU360-IS34, SWMU360-IS35, SWMU360-IS36, and SWMU360-IS37). Once a 4-feet sleeve sample had been collected at the target depth from each of the four borings (as determined by the field screening), the acetate liner was cut in-half and each half was capped at both ends and duct taped. The soil samples were submitted to fixed-base laboratories for TOC and TOD testing. Laboratory data for the DPT soil samples are included in **Appendix B**.

2.1.2 Groundwater Investigation

Eight additional DPT borings (SWMU360-IS37, SWMU360-IS38, SWMU360-IS39, SWMU360-IS40, SWMU360-IS41, SWMU360-IS42, SWMU360-IS43, and SWMU360-IS44) were advanced in the down-gradient and side-gradient areas of the groundwater plume. All direct push sampling locations are shown on **Figure 2-1**.

Four borings were advanced to just below the water table for the collection of shallow (approximately 22 to 26 ft bgs) groundwater samples, while the other four borings were advanced for the collection of both shallow and intermediate (approximately 38 to 42 ft bgs) groundwater samples. When the target depth was reached in a borehole, the screen on the sampler was deployed and groundwater samples were collected using polyethylene tubing and a peristaltic pump. Once the shallow sample had been collected, the rods and sampler were removed from the borehole, and a decontaminated set of rods and sampler were advanced in the same borehole to collect groundwater samples from deeper zones. New clean tubing was used to collect groundwater samples from each sampling depth.

Once the target depth of each borehole had been reached and all samples had been collected, the borehole was abandoned using a grout mixture with Portland cement conforming to American Society for Testing and Materials (ASTM) requirements and North Carolina Department of Environment and Natural Resources (NCDENR) guidelines.

A summary of the sampling and analytical program is presented in the Site-specific Quality Assurance Project Plan (QAPP). Groundwater samples were analyzed for VOCs by EPA method SW846-8260. Laboratory data for the DPT groundwater samples are included in **Appendix B**.

2.2 Monitoring Well Installation

Four additional Type II shallow monitoring wells and two Type III (double cased) intermediate wells were installed. The locations of SWMU 360 monitoring wells installed for the amended RFI are shown on **Figure 2-2**. Type II shallow monitoring wells (SWMU360-MW09, SWMU360-MW10, SWMU360-MW11, and SWMU-360MW12) were installed using rotary hollow-stem augers. Type III intermediate monitoring wells (SWMU360-MW09IW and SWMU360-MW10IW) were installed using hollow-stem augers and mud rotary drilling techniques. Boreholes for the shallow monitoring wells were advanced to a depth of 26 feet bgs, while intermediate monitoring wells were advanced to depths of approximately 45 feet bgs. Standard split-spoon soil samples were collected from each well boring for lithological descriptions and field screening. For the paired wells, split spoons samples were only collected from the intermediate well boring. The new monitoring wells were installed and developed in accordance with Navy CLEAN SOPs, CH2M HILL SOPs, and the Master Plans (CH2M HILL, June 2004). A summary of well construction and water level information is presented in **Table 2-1**. Boring logs and well construction diagrams are included in **Appendix C**.

2.3 Monitoring Well Sampling

All 13 existing wells (SWMU360-MW01, SWMU360-MW01IW, SWMU360-MW02, SWMU-360MW02IW, SWMU360-MW03, SWMU360-MW03IW, SWMU360-MW04, SWMU-360MW05, SWMU360-MW06, SWMU360-MW07, SWMU-360MW08, IR78-GW39 and UST well 1817-MW01) and the 6 newly installed wells (SWMU360-MW09, SWMU360-MW09IW, SWMU360-MW10, SWMU360-MW10IW, SWMU360-MW11, and SWMU-360MW12) were sampled. Monitoring well locations are shown on **Figure 2-2**. For the new monitoring wells, sampling took place no sooner than 48-hours after completion of well development in order to allow an adequate amount of time for the wells to equilibrate. The wells were purged and sampled using peristaltic pumps and low-flow purging/sampling methods in accordance with Navy CLEAN SOPs, CH2M HILL SOPs, and the Master Plans (CH2M HILL, June 2004). Groundwater sampling sheets from the January 2006 sampling event are included in **Appendix D**.

The water level and Water Quality Parameters (WQPs) were measured frequently during purging. Purging was deemed complete when three successive readings of pH, specific conductance, and temperature had stabilized to within 10 percent or there was no further discernable upward or downward trend. A minimum of one well volume was purged prior to sampling, even in the event that WQP readings stabilized quickly. Upon WQP stabilization, groundwater samples were collected and placed into appropriate sample containers, for VOC analysis by EPA method SW846-8260. Samples were stored on ice under Chain-Of-Custody control pending shipment to the laboratory. Laboratory data from the January 2006 monitoring well sampling event are included in **Appendix B**.

2.4 Hydraulic Conductivity Testing

Rising head tests were performed on three monitoring wells screened in the shallow aquifer and three wells screened in the intermediate aquifer. Monitoring well pairs SWMU360-MW01 and MW01IW, SWMU360-MW09 and MW09IW and pair SWMU360-MW10 and MW10IW were utilized for the testing. The tests were performed using a slug and datalogger. The data was then reduced using the Bouwer and Rice method by plotting the change in head verses time. Conductivity test results are presented in **Appendix E**.

2.5 Geotechnical Analysis

A total of three undisturbed soil samples were collected using Shelby tubes within the vicinity of SWMU 360 for the determination of vertical permeability and grain size. One soil boring was advanced near the SWMU source (SWMU360-SB33, located south of Building 1817) while two additional samples were collected from monitoring well borings SWMU360-MW-9 and SWMU360-MW-10. The three samples were collected from depths of 2 ft to 4 ft bgs (SWMU360-SB33), 8 ft to 10 ft bgs (SWMU360-MW-9), and 14 ft to 16 ft bgs (SWMU360-MW-10). Once collected, the undisturbed Shelby tube samples were submitted to a fixed-base geotechnical laboratory (Geotechnics, Raleigh, North Carolina) for analyses. The geotechnical laboratory report is included in **Appendix F**.

2.6 Survey of Monitoring Wells and DPT Sampling Locations

The DPT sample locations and monitoring wells were surveyed by SEPI Engineering Group, a surveying subcontractor licensed in the State of North Carolina. The survey included topographic elevation relative to mean sea level (msl) and horizontal position within the North Carolina State Plane Coordinate System.

2.7 Quality Assurance/Quality Control

Specific Quality Assurance/Quality Control (QA/QC) requirements are presented in the Master QAPP, which is contained in the Master Project Plans. The Master QAPP describes the different levels of sample analysis and the associated QC procedures required with each. Adherence to established USEPA chain-of-custody (COC) procedures during the collection, transport, and analyses of the samples was maintained throughout the project. Laboratory analyses of the samples conform to accepted QA requirements.

The required QA/QC samples were collected and prepared during the field activities to ensure precision, accuracy, representativeness, completeness, and comparability of the data. Field duplicate samples, matrix spike and matrix spike duplicates, rinsate blanks, field blanks, and trip blanks were collected and analyzed. Laboratory QA/QC samples were analyzed according to USEPA's contract laboratory program (CLP) protocol.

Analytical laboratory data were reviewed and validated by a third party subcontractor. Acetone and 2-butanone were detected in field and laboratory blanks related to the DPT groundwater samples. According to USEPA protocol, positive results for these contaminants that were less than or equal to ten times the blank contamination level were considered invalid for the associated samples. Data validation summary reports are included in **Appendix G**.

Table 2-1
Monitoring Well Construction Summary
SWMU 360 Amended RFI Report
MCB Camp Lejeune

Well Identification	Date Installed	Top of PVC Casing Elevation (feet above msl)	Ground Surface Elevation (feet above msl)	Well Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Sand/Slough (feet bgs)	Depth to Bentonite (feet bgs)	Static Water Level (feet below TOC)	Static Water Elevation (feet above msl)
Shallow Aquifer									
SWMU360-MW01	7/13/2003	27.25	27.51	28	18 - 28	16	13.1	21.19	6.06
SWMU360-MW02	7/12/2003	26.24	26.38	28	18 - 28	16	14	19.90	6.34
SWMU360-MW03	7/14/2003	24.26	24.62	28	18 - 28	16	14	18.98	5.28
SWMU360-MW04	7/13/2003	25.71	26.04	28	18 - 28	16	14	20.10	5.61
SWMU360-MW05	7/15/2003	22.92	23.31	25	15 - 25	13	11	16.64	6.28
SWMU360-MW06	7/14/2003	24.54	24.85	27	17 - 27	15	13	17.45	7.09
SWMU360-MW07	7/10/2003	25.25	25.35	25	15 - 25	13	11.2	18.99	6.26
SWMU360-MW08	7/13/2003	26.32	26.68	26.9	16.9 - 26.9	14.8	12	18.85	7.47
1817-MW01	8/14/1997	26.13	26.8	25	15 - 25	13	11	19.40	6.73
IR78-GW39	Information not available								
SWMU360-MW09	**1/10/2006**	**19.5**	**19.87**	**25**	**15 - 25**	**13**	**11**	**14.82**	**4.68**
SWMU360-MW10	**1/10/2006**	**23.58**	**23.82**	**25**	**15 - 25**	**13**	**11**	**19.32**	**4.26**
SWMU360-MW11	**1/11/2006**	**23.86**	**24.42**	**27**	**17 - 27**	**15**	**13**	**19.23**	**4.63**
SWMU360-MW12	**1/11/2006**	**20.64**	**21.15**	**25**	**15 - 25**	**13**	**11**	**16.50**	**4.14**
Intermediate Aquifer									
SWMU360-MW01IW	7/12/2003	27.41	27.55	45	40 - 45	38	34.6	21.35	6.06
SWMU360-MW02IW	7/11/2003	26.17	26.42	45	40 - 45	37.4	34.9	21.90	4.27
SWMU360-MW03IW	7/13/2003	24.3	24.66	45	40 - 45	39	38	19.02	5.28
SWMU360-MW09IW	**1/13/2006**	**19.44**	**19.88**	**45**	**40 - 45**	**38**	**31**	**14.80**	**4.64**
SWMU360-MW10IW	**1/12/2006**	**23.46**	**24**	**45**	**40 - 45**	**38**	**34**	**19.18**	**4.28**

NOTES:
1) Groundwater levels were measured on January 18, 2006
2) Bold denotes newly installed wells

Table 2-2
Summary of Groundwater Quality Parameters
SWMU 360 Amended RFI Report
MCB Camp Lejeune

Monitoring Well ID	Sample Date	Depth to Water (ft bgs)	Temperature (°C)	Conductivity (umhos/cm)	Dissolved Oxygen (mg/L)	pH (SU)	Oxidation/ Reduction Potential (mV)	Turbidity (NTU)
SWMU360-MW01	1/19/06	21.19	21.46	0.623	0.26	7.74	84	20.5
SWMU360-MW01IW	1/19/06	21.35	20.94	0.322	0.00	8.21	-145	15.7
SWMU360-MW02	1/19/06	19.90	20.32	0.534	0.52	7.35	109	27.7
SWMU360-MW02IW	1/19/06	21.90	20.14	0.600	0.16	7.76	81	8.2
SWMU360-MW03	1/19/06	18.98	21.56	0.635	0.15	7.79	35	18.0
SWMU360-MW03IW	1/19/06	19.02	21.17	0.300	0.03	8.50	-113	4.0
SWMU360-MW04	1/19/06	20.10	21.00	0.567	0.11	7.74	109	16.6
SWMU360-MW05	1/19/06	16.64	21.29	0.211	7.21	4.99	304	9.5
SWMU360-MW06	1/19/06	17.45	21.48	0.149	7.57	6.36	220	14.3
SWMU360-MW07	1/19/06	18.99	20.55	0.605	0.96	6.94	122	4.8
SWMU360-MW08	1/19/06	18.85	21.23	0.679	1.12	6.77	142	8.4
*1817-MW01	1/19/06	19.40	21.44	1.000	1.51	6.15	109	4.5
SWMU360-MW09	1/18/06	14.84	22.09	0.275	5.05	7.08	205	12.2
SWMU360-MW09IW	1/18/06	14.80	21.20	1.260	6.45	13.41	-127	16.5
SWMU360-MW10	1/18/06	19.32	22.10	0.596	1.07	7.81	110	18.4
SWMU360-MW10IW	1/18/06	19.18	20.80	0.438	0.12	8.85	50	5.9
SWMU360-MW11	1/19/06	19.23	20.90	0.682	0.57	7.64	-21	73.8
SWMU360-MW12	1/19/06	16.50	22.00	0.545	0.30	7.57	48	59.2
IR78-GW39	1/19/06	14.78	19.80	0.270	2.60	5.13	300	7.9

Notes:
ft bgs = feet below ground surface
umhos/cm = micromhos per centimeter
mg/L = milligrams per liter
SU = Standard Units
mV = millivolts
NTU = Nepholometric Turbidity Unit

Figure 2-1
DPT Soil and Groundwater Locations
SWMU 360
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

CH2MHILL

File Path: X:\USNavFaceNGCom\315007CampLejeune\Projects\SWMU360\Figure_2_1_SWMU360_DPT_GW_locations.mxd

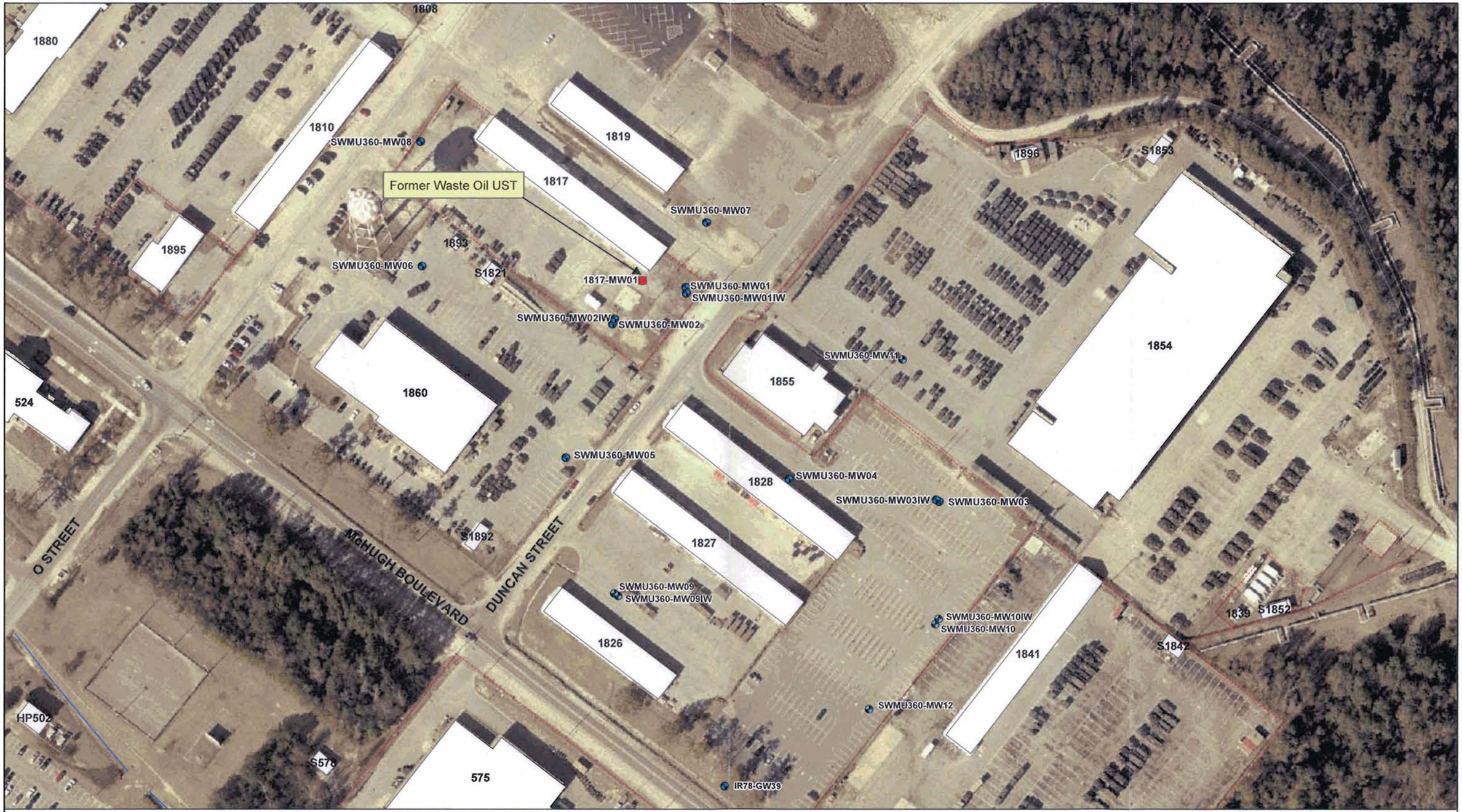


Figure 2-2
Monitoring Well Locations
SWMU 360
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

CH2MHILL

File Path: X:\USNavFaceNGCom\315007CampLejeune\Projects\SWMU360\Figure_2_2_SWMU360_MWLocations

3.0 Site Geological and Hydrogeological Characteristics

This section describes geologic and hydrogeologic characteristics of SWMU 360, in light of the additional field investigation. The physical characteristics of the region, the topography of SWMU 360, and its surface features, and the surface water hydrology are described in the 2005 RFI report.

The geology and hydrogeology of SWMU 360 was assessed during the advancement of DPT borings and during the installation of monitoring wells at the site. Locations of two cross-sections are shown on **Figure 3-1.** Stratigraphic cross-sections generated from the monitoring well boring logs are presented on **Figure 3-2** and **Figure 3-3**.

3.1 Site Geology

Within the vicinity of SWMU 360, the uppermost undifferentiated formation of Holocene and Pleistocene age sediments consists of mostly fine to medium grained, medium dense sands with a lesser amount of silt and clay and is present to depths of 20 ft to 30 ft bgs. Thin discontinuous lenses of clay were identified within the undifferentiated formation, although the clay lenses may be regionally associated with the Miocene age Belgrade formation. The Belgrade formation, which generally consists of olive gray silts and clays and fine sands, with lesser amounts of shell and fossil fragments, was not identified within the soil borings at SWMU 360.

The upper portion of the Oligocene age River Bend formation underlies the Holocene and Pleistocene sediments. Within the vicinity of SWMU 360, the River Bend formation is present as discontinuous lenses composed of sands, silt, shell and fossil fragments, and trace amounts of clay. Some of the sands were identified as being cemented within the formation. The amount of shell fragments within the formation decreases with depth down to approximately 25 ft bgs. Below the shell fragments fine silty sands extend to depths of 45 ft bgs.

The locations of the A-A′ and B-B′ geologic cross-sections are shown on **Figure 3-1**. Cross-section A-A′ trends northwest-southeast across the central region of SWMU 360 (southwest of Building 1817) and extending downgradient and parallel to the groundwater flow direction (**Figure 3-2**). Cross-section B-B′ trends southwest-northeast across the central region of SWMU 360 and perpendicular to the groundwater flow direction (**Figure 3-3**). Both sections include the stratigraphic sequence of the undifferentiated formation and River Bend formation described above.

The undifferentiated formation varies in depth across the A-A′ cross-section, varying from approximately 25 feet deep within the vicinity of SWMU 360 (near monitoring well SWMU 360-MW02IW) to approximately 20 feet deep southeast of SWMU 360 (within the vicinity of monitoring well SWMU360-MW10IW). Along cross-section A-A′ and near monitoring well

SWMU360-MW02 the lithology of the undifferentiated formation consists mostly of fine silty sand. A discontinuous, semi-plastic, silty clay layer is present within the vicinity of SWMU 360 from approximately 5.5 ft to 10 ft bgs and identified within the boring logs for monitoring wells SWMU360-MW01 and SWMU360-MW02. However, this shallow clay lens was not identified northwest (at boring log for well SWMU360-MW08) or southeast (at boring log for well SWMU360-MW04) of SWMU 360 along the A-A' cross section. In addition, a discontinuous, semi-plastic, silty clay and clayey sand layer is present within the vicinity of SWMU 360 at depths of 20 ft to 25 ft bgs. This discontinuous clay zone was identified within the boring logs for monitoring wells SWMU360-MW08, SWMU360-MW02, and SWMU360-MW04, but appears to pinch-out downgradient of SWMU 360 and is not present at the boring for well SWMU360-MW10. Fossil shells and partially cemented sands in the upper portion of the River Bend formation, were identified between 20 to 25 ft bgs and were generally discontinuous across the A-A' cross section at SWMU 360. Shell fragments were identified in the boring logs for well SWMU360-MW08 at 24 ft to 26 ft bgs and well SWMU360-MW04 at 21.5 ft to 28 ft bgs. The fossil layer is an identifying characteristic of the River Bend formation (Cardinell et al., 1993).

Cross section B-B' trends southwest-northeast within the vicinity of SWMU 360 (**Figure 3-1**). The undifferentiated formation consisted of silty sands near the surface and a discontinuous, semi-plastic, silty clay layer present at approximately 5.5 ft to 10 ft bgs within the vicinity wells SWMU360-MW02 and SWMU360-MW01 along the B-B' cross section. However, the clay layer pinches out northeast of SWMU 360 as indicated by only thin clay lenses at approximately 6.5 ft bgs within the boring log for well SWMU360-MW07. In addition, a discontinuous, plastic, silty clay and clayey sand layer is present within the vicinity of SWMU 360 at depths of 12 ft to 25 ft bgs across the B-B' cross section. This discontinuous clay zone was identified within the boring logs for monitoring wells SWMU360-MW07, SWMU360-MW01, and SWMU360-MW02, but was not identified at SWMU360-MW05. Fossil shells and partially cemented sands of the upper portion of the River Bend formation were generally discontinuous across the B-B' cross section and only observed within the boring log for well SWMU360-MW07 (between 16 ft to 24 ft bgs).

3.2 Site Hydrogeology

The additional investigation activities discussed in this RFI addendum have been limited to the shallow and intermediate aquifer zones.

During the January 18, 2006 well gauging event (**Table 2-1**), the static water level elevations of the unconfined shallow aquifer at SWMU 360 ranged from 4.14 feet msl at monitoring well SWMU360-MW12 to 6.38 feet msl at well SWMU360-MW08. In general, groundwater flow direction within the shallow aquifer of SWMU 360 is to the southeast and in the direction of Cogdels Creek. The horizontal hydraulic gradient in January 2006 within the shallow zone is approximately 0.002 feet per foot (ft/ft) between wells SWMU360-MW08 and SWMU360-MW10. A groundwater contour map of the shallow zone is shown on **Figure 3-4**.

Static water level elevations in January 18, 2006 within the intermediate zone ranged from 3.18 feet msl at SWMU360-MW02IW to 4.97 feet msl at well SWMU360-MW01IW. In general, the groundwater flow direction within the intermediate zone is to the southeast.

The horizontal hydraulic gradient within the intermediate zone at SWMU 360 was approximately 0.001 ft/ft between wells SMWU360-MW01IW and SWMU360-MW10IW. A groundwater contour map of the intermediate zone is shown on **Figure 3-5**.

Aquifer testing was performed by CH2M HILL in January 2006 through the use of slug tests on three shallow wells (SWMU360-MW01, SWMU360-MW09, and SWMU360-MW10) and three intermediate-depth wells (SWMU360-MW01IW, SWMU360-MW09IW, and SWMU360-MW10IW). Due to the generally unconfining conditions of the surficial and intermediate aquifers at SWMU 360, the Bouwer and Rice slug test method was selected for calculating hydraulic conductivities. A bail-down slug test was conducted at each of the six wells that included withdrawing water out of the well casing with a bailer and recording the changes in water level within the well with a pressure transducer/datalogger. The resulting data from these tests are shown in **Table 3-1**. Slug test curves collected from the monitoring wells are provided in **Appendix E**. The hydraulic conductivity in the shallow wells ranged from 2.36 feet per day (ft/day) at well SWMU360-MW09 to 17 ft/day at well SWMU360-MW01 with a geometric mean of 7.8 ft/day. However, the hydraulic conductivity determined for well SWMU360-MW01 may be biased high due to the poor quality of the slug test curve generated with the plotted data collected in the field. The mean hydraulic conductivity value of 7.8 ft/day determined during the RFI Addendum field activities is slightly higher than the value of 4.2 ft/day determined during the RFI.

The hydraulic conductivity in the intermediate aquifer wells (River Bend Formation) ranged from 0.13 ft/day at well SWMU360-MW09IW to 7.2 ft/day at well SWMU360-MW01IW with a geometric mean of 2.8 ft/day (**Table 3-1**). Lower hydraulic conductivities in the intermediate aquifer as compared with the shallow aquifer may be due to the presence of more silts and fine sands within the zone where the intermediate wells are screened. However, the mean hydraulic conductivity value of 2.8 ft/day determined during the RFI Addendum field activities is lower than the value of 22.3 ft/day determined in July 2003 during the RFI (**Appendix E**). During the RFI, wells that were screened across the lithologic units of fine-to-coarse grained sands and gravels or shell fragments were grouped together as being within the upper Castle Hayne aquifer (River Bend Formation). However, only 2 of the 6 wells within this group were intermediate wells and had lower hydraulic conductivity values (0.6-10.7 ft/day) as compared with the other 4 shallow wells within this same group (17.9-42.3 ft/day). Due to the large range of hydraulic conductivity values determined for the wells grouped within the upper Castle Hayne aquifer for the RFI, the average conductivity value of 22.3 ft/day determined during the RFI may be biased high as compared to the conductivity value of 2.8 ft/day as determined during the RFI Addendum field activities.

Limited studies on the vertical permeability within the vadose zone near and downgradient of SWMU 360 were also conducted in January 2006. Undisturbed soil samples were collected from three borings (SWMU360-SB33, SWMU360-MW09, and SWMU360-MW10) and submitted to a geotechnical laboratory for permeability testing following the ASTM Method D5084-90 and for sieve and hydrometer analysis using ASTM Method D422-63 (**Appendix F**). The geotechnical data is presented in **Table 3-2**. Three Shelby tube samples (2 to 4 ft bgs from SWMU360-SB33, 8 to 10 ft bgs from SWMU360-MW09, and 14 to 16 ft bgs from SWMU360-MW10) were collected from the poorly graded sand and silty sand layers that are present within the vadose zone. Although there was a limited amount of cohesive

soils present in the vadose zone at SWMU 360, adequate Shelby tube samples were collected from all three borings. Vertical permeabilities within the poorly graded sand layers ranged from 1.3 ft/day (2 to 4 ft bgs from 360-SB33) to 3.1 ft/day (8 to 10 ft bgs from SWMU360-MW09), while the vertical permeability of the finer grained silty sands was measured to be 0.21 ft day (14 to 16 ft bgs from SWMU360-MW10).

Vertical hydraulic potentials were calculated between the shallow and intermediate zones using the water-level data between adjacent wells screened in the respective intervals (well pairs MW01 and MW01IW, MW09 and MW09IW and MW10 and MW10IW). Based on the January 2006 water-level data, no downward potential exists between well pair MW01 and MW01IW, while a slight downward potential of 0.002 ft/ft exists between MW09 and MW09IW and a slight upward potential of 0.0009 ft/ft exists between pair MW10 and MW10IW. The water-level data from January 2006 appears to indicate that the vertical gradient potential varies slightly, but is generally downward throughout the area.

Table 3-1
Hydraulic Conductivity Data from Slug Tests at SWMU 360
Amended RFI Report
MCB Camp Lejeune, North Carolina.

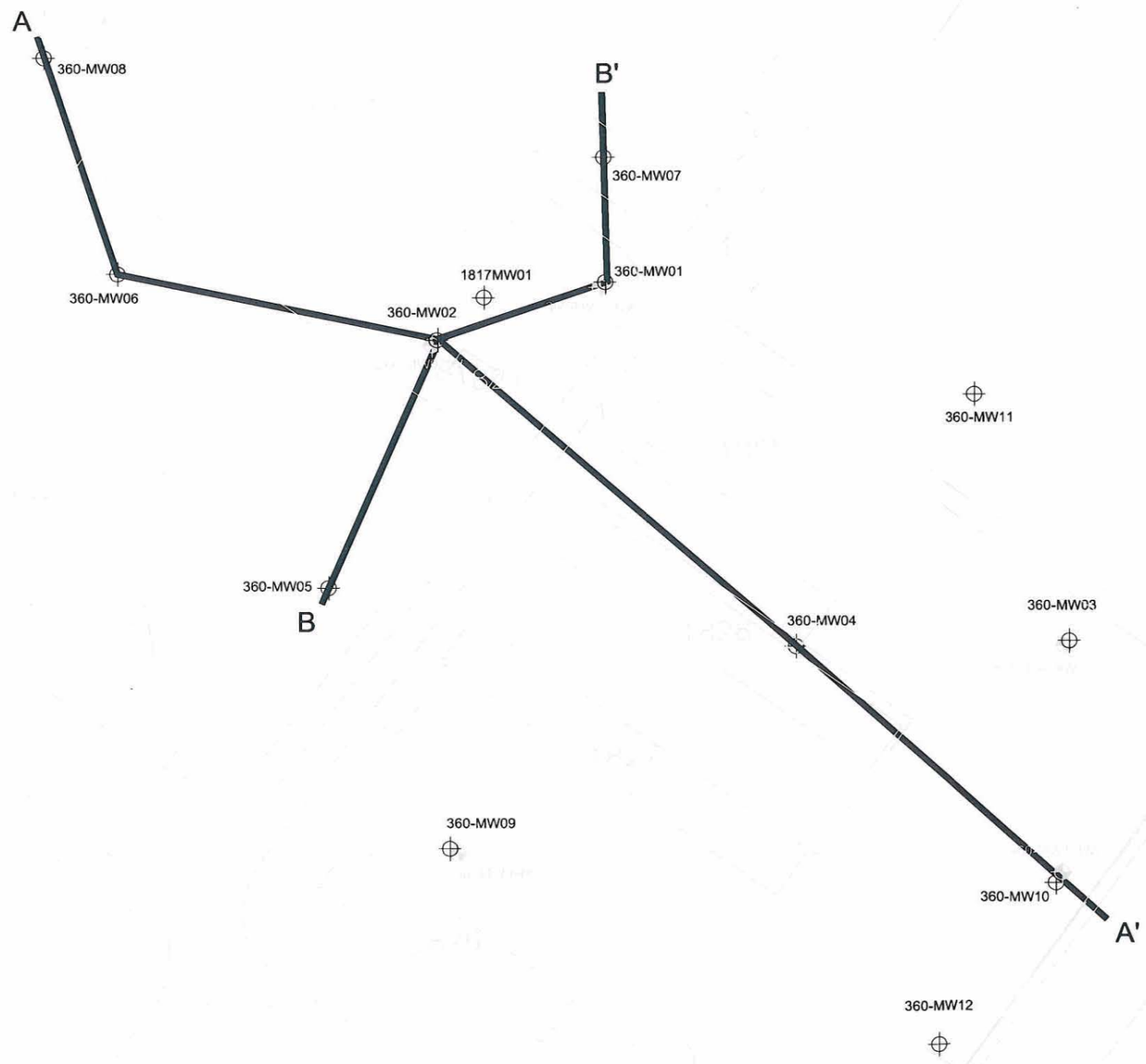
Well Identification	Aquifer Unit	Test Date	Well Depth (feet bgs)	Screen Interval (feet bgs)	Hydraulic Conductivity (ft/day)	Mean Hydraulic Conductivity (ft/day)
SWMU360-MW01	Shallow	1/27/2006	28	18 - 28	17 *	7.8
SWMU360-MW09		1/27/2006	25	15 - 25	2.36	
SWMU360-MW10		1/27/2006	25	15 - 25	3.98	
SWMU360-MW01IW	Intermediate	1/27/2006	45	40 - 45	7.2	2.8
SWMU360-MW09IW		1/27/2006	45	40 - 45	0.13	
SWMU360-MW10IW		1/27/2006	45	40 - 45	1.2	

bgs = Below ground surface.
bTOC = Below Top-of-Casing.
ft/day = Feet per day.
* May be biased high due to the poor quality of the slug test curve plotted with the data collected from well SWMU360-MW01 during the RFI Addendum field activities.

Table 3-2
Geotechnical Data from Shelby Tubes Samples Collected at SWMU 360
Amended RFI Report
MCB Camp Lejeune, North Carolina.

Boring Identification	Sample Date	Shelby Tube Sample Depth (ft bgs)	Vertical Permeability (cm/sec)	Vertical Permeability (ft/day)	Moisture Content (%)	Unit Dry Weight (g/cm^3)	Porosity (n)	Percent Fines (<#200 Sieve)	USCS Symbol	USCS Classification
SWMU360-SB33	1/12/2006	2-4	4.6E-04	1.3	16.3	1.70	0.37	7.71	SP-SM	poorly graded sand with silt
SWMU360-MW09	1/10/2006	8-10	1.1E-03	3.1	8.0	1.54	0.43	3.74	SP	poorly graded sand
SWMU360-MW10	1/10/2006	14-16	7.4E-05	0.21	15.8	1.58	0.41	28.64	SM	silty sand

ft bgs	Feet below ground surface.
cm/sec	Centimeters per second.
ft/day	Feet per day.
g/cm^3	Grams per cubic centimeter.
USCS	Unified Soil Classification System.



LEGEND

360-MW02 ⊕ SHALLOW DEPTH MONITORING WELL (15'-30')

INTERMEDIATE DEPTH MONITORING WELL (40'-45')

A-A' CROSS-SECTION LOCATION

100 0 50 100

1 inch = 100 ft.

FIGURE 3-1
CROSS-SECTION
LOCATION MAP
SMWU 360
AMENDED RFI REPORT
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

CH2MHILL

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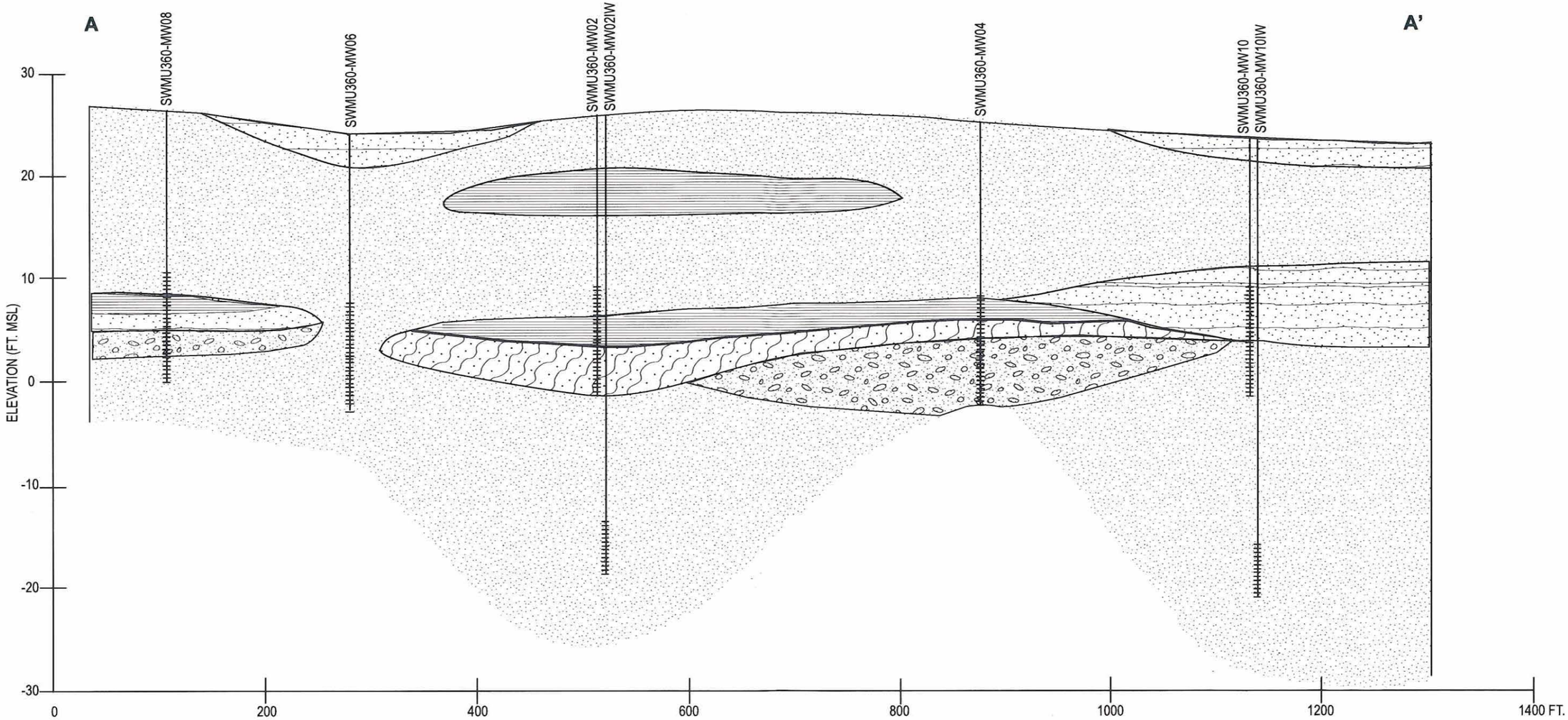
SOURCE: MCB CAMP LEJEUNE, 2000.



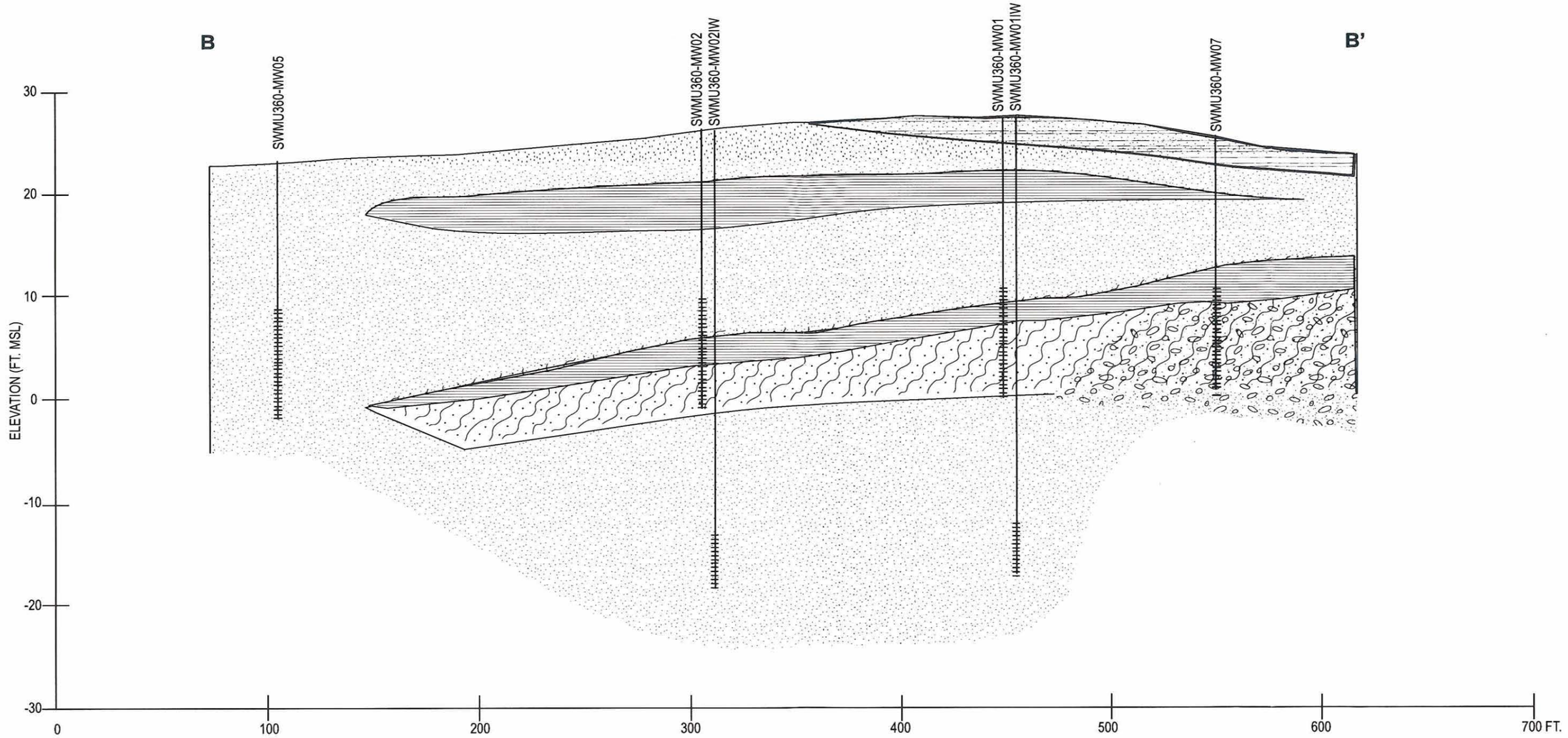
LEGEND:

- Silty Sand (SM)
- Fine Sand with some Silt (SP-SM)
- Inorganic Clay (CL)
- Monitoring Well
- Clayey Sand (SC)
- Fine Sand (SP) w/ Shell Fragments

HORIZONTAL SCALE: 1'=100'
VERTICAL SCALE: 1'=10'

Notes:
The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions applies only to the specific locations and dates indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.

FIGURE 3-2
GENERALIZED GEOLOGIC CROSS-SECTION A-A'
SWMU 360
AMENDED RFI REPORT
MCB CAMP LEJEUNE, NORTH CAROLINA



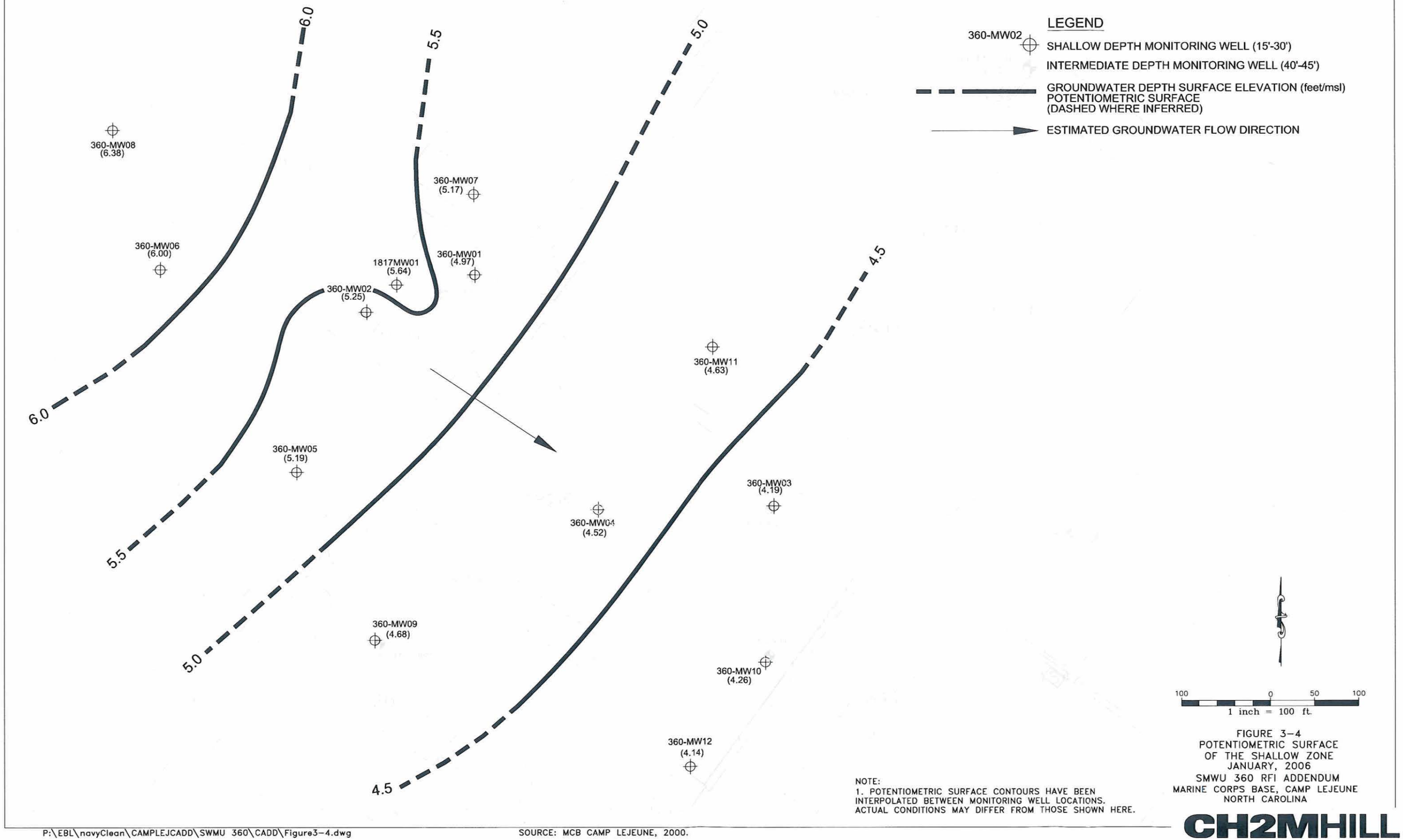
LEGEND:

- Inorganic Silt (ML)
- Fine Sand with some Silt (SP-SM)
- Inorganic Clay (CL)
- Monitoring Well
- Clayey Sand (SC)
- Fine to Coarse Sand (SW) with Shell Fragments

HORIZONTAL SCALE: 1'=50'
VERTICAL SCALE: 1'=10'

Notes:
The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions applies only to the specific locations and dates indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.

FIGURE 3-3
GENERALIZED GEOLOGIC CROSS-SECTION B-B'
SWMU 360
AMENDED RFI REPORT
MCB CAMP LEJEUNE, NORTH CAROLINA



NOTE:
1. POTENTIOMETRIC SURFACE CONTOURS HAVE BEEN INTERPOLATED BETWEEN MONITORING WELL LOCATIONS. ACTUAL CONDITIONS MAY DIFFER FROM THOSE SHOWN HERE.

FIGURE 3-4
POTENTIOMETRIC SURFACE
OF THE SHALLOW ZONE
JANUARY, 2006
SMWU 360 RFI ADDENDUM
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

CH2MHILL

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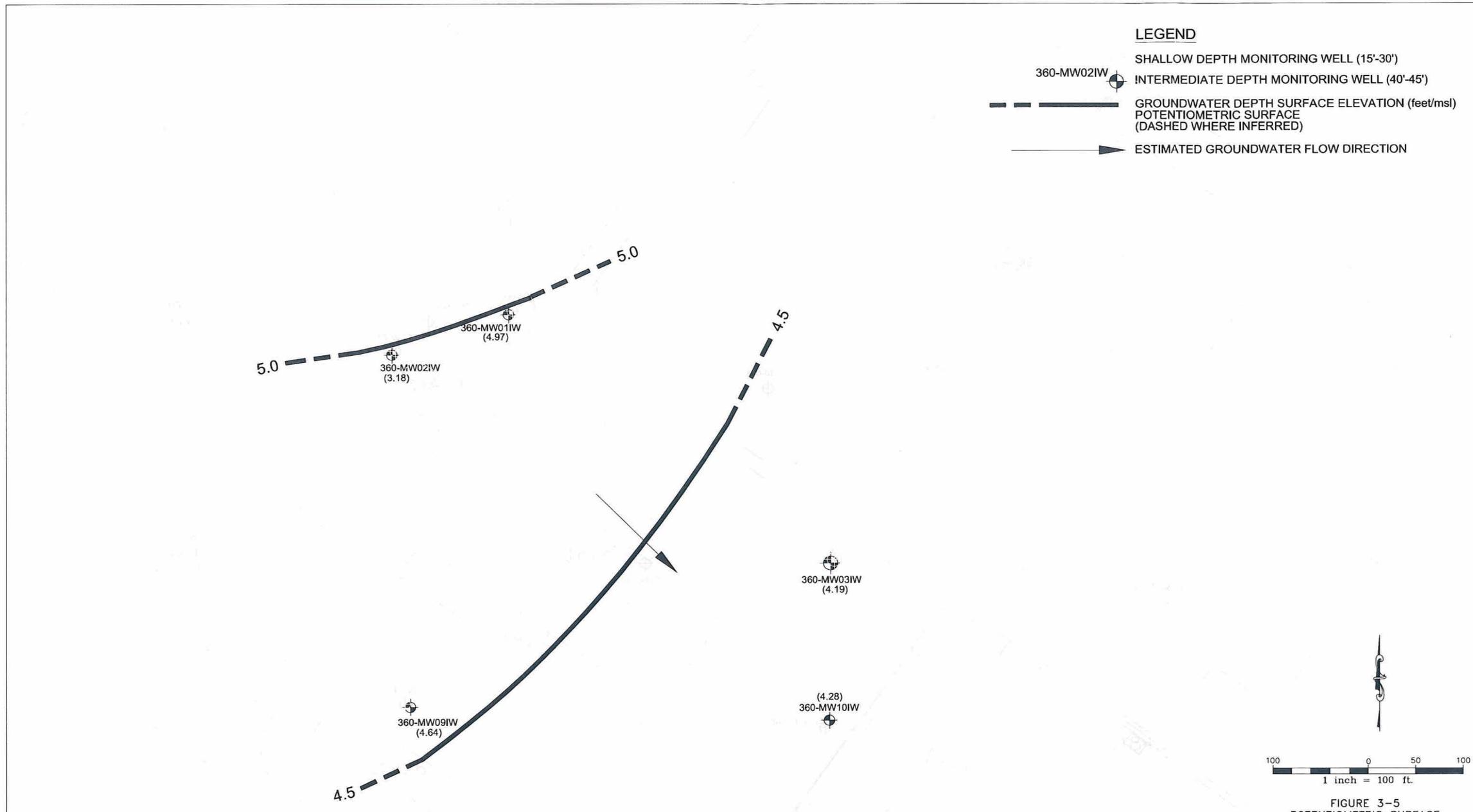
SOURCE: MCB CAMP LEJEUNE, 2000.



NOTE:
1. POTENTIOMETRIC SURFACE CONTOURS HAVE BEEN INTERPOLATED BETWEEN MONITORING WELL LOCATIONS. ACTUAL CONDITIONS MAY DIFFER FROM THOSE SHOWN HERE.

FIGURE 3-5
POTENTIOMETRIC SURFACE
OF THE INTERMEDIATE ZONE
JANUARY 2006
SMWU 360 RFI ADDENDUM
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

CH2MHILL

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SOURCE: MCB CAMP LEJEUNE, 2000.

4.0 Nature and Extent of Contamination

This section discusses the nature and extent of contamination found in soil and groundwater at SWMU 360 during the amended RFI field activities. A discussion of field activities is presented in Section 2.0 of this report. Section 4.2.1 presents the nature and extent of contaminant concentration in the subsurface soil. The nature and extent of contaminant concentrations in the groundwater is presented in section 4.2.2.

Analytical results of surface and subsurface soil and groundwater samples collected during the previous RFI (Baker, 2005) are presented in **Appendix A**. Complete analytical results of samples collected during the amended RFI field activities are presented in **Appendix B**.

4.1 Regulatory and Health-Based Comparison Criteria

Soil and groundwater samples analyzed for this amended RFI were compared to the following regulatory standards:

- *Soil* results were compared to the North Carolina Soil to Groundwater Screening criteria (SSLs) and to Region IX USEPA Preliminary Remediation Goals (PRGs) for residential exposure
- *Groundwater* results were compared to the North Carolina 15A NCAC 2L Groundwater Standards.

The chemical-specific regulatory criteria used to evaluate soil and groundwater results are included on all data summary tables and figures.

4.2 Amended RFI Sampling Results

4.2.1 Soil Sample Results

Earlier assessment activities (RFI, 2005 and CSI) concluded that surface soil at this site is not contaminated. For the amended RFI, five DPT soil borings (SWMU360-IS34 through IS37 and IS45) were installed around the former UST area to further define the extent of shallow soil contamination. Near-surface soil samples were collected from an interval of 1 to 3 ft bgs, and deeper samples were collected at depths ranging from 14 to 19 feet bgs. No soil samples were collected from beneath the groundwater surface. The soil samples were analyzed by EPA Method SW846-8260 for VOCs.

In the near-surface samples, trace concentrations (lower than 10 µg/kg) of the hydrocarbon fuel components ethylbenzene, toluene, and xylene were detected, all at concentrations below comparison criteria. Methylcyclohexane, acetone, PCE, and cis-1,2-DCE were also detected. The only exceedance of the comparison criteria was PCE, reported in sample SWMU360-IS37 at a concentration of 8.2 µg/Kg, compared to the SSL standard of 7.42 µg/kg. Analytical results for the near-surface soils are summarized in **Table 4-1**.

Chlorinated VOC (CVOC) concentrations within the near-surface soil are presented on **Figure 4-1.** Vinyl chloride was not detected in any soil sample.

The same VOCs at similar concentrations were detected in the subsurface soil samples collected from 14 to 19 feet bgs, with the addition of trichloroethene. Again, the only exceedance above comparison criteria was PCE, detected in subsurface soil sample SWMU360-IS35, at a concentration of 140 µg/Kg. Subsurface soil analytical results for the 14 to 19 ft zone are summarized in **Table 4-2**, and CVOCs are illustrated on **Figure 4-2**.

Figure 4-3 shows the estimated delineation of PCE in the vadose zone soil at SWMU 360. Current soil data and data from the 2005 RFI investigation (collected June 2003) are combined on the same figure to show the complete delineation of the impacted soil.

4.2.2 DPT Groundwater Sample Results

Groundwater samples were obtained from eight DPT borings during the additional RFI field activities. The samples were collected to help delineate the horizontal extent of the groundwater contaminant plume and to help in placement of permanent monitoring wells. The borings were advanced in the down-gradient and side-gradient areas of the groundwater plume estimated in the 2005 RFI report. Eight DPT groundwater samples were collected from a shallow aquifer depth of 22 to 26 ft bgs, and four samples were collected from an intermediate aquifer depth of 38 to 42 ft bgs. The DPT groundwater samples were analyzed for VOCs by EPA Method SW846-8260.

4.2.2.1 Shallow Aquifer

Table 4-3 presents the analytes detected within the shallow aquifer DPT samples. In the shallow sampling zone, trace amounts of VOCs were detected, including CVOCs. The only compounds that had concentrations exceeding the comparison criteria were CVOCs. PCE was reported in excess of the NCAC 2L Groundwater Standards in five of the eight sample locations and TCE exceeded the standard in two locations. PCE was reported in samples from locations SWMU360-IS37, IS40, IS41, IS43 and IS44 at concentrations of 180 µg/L, 11 µg/L, 1.4J µg/L, 0.81J µg/L, and 3.4J µg/L, respectively. TCE exceeded the standard in samples from locations SWMU360-IS37 and IS40 at concentrations of 54 µg/L and 5.6 µg/L, respectively, as shown on **Table 4-3** and illustrated on **Figure 4-4**. Cis-1,2-DCE and vinyl chloride were also reported in excess of the standard at location SWMU360-IS37 at concentrations of 120 µg/L, and 0.51J µg/L, respectively.

4.2.2.2 Intermediate Aquifer

In the intermediate sampling zone, PCE was reported at estimated concentrations in excess of the NCAC 2L Groundwater Standards in two of the four sample locations. PCE was reported in samples from locations SWMU360-IS37 and IS40 at estimated concentrations of 0.83J µg/L, and 4J µg/L, respectively, as shown on **Table 4-4** and illustrated on **Figure 4-5**. TCE and cis-1,2-DCE were detected but did not exceed the standard in any of the intermediate depth DPT locations. Vinyl chloride was not detected in groundwater at this depth.

4.2.3 Monitoring Well Groundwater Sample Results

Groundwater samples were obtained from 14 shallow and five intermediate depth monitoring wells, including the new and previously installed wells. All groundwater samples were analyzed for VOCs by EPA Method SW846-8260.

4.2.3.1 Shallow Aquifer

Table 4-5 presents the analytes detected within the shallow aquifer monitoring well samples. VOCs were detected, including the fuel-related compounds and CVOCs. Benzene, PCE, TCE, cis-1,2-DCE, and vinyl chloride were detected at concentrations exceeding the comparison criteria. These exceedances are described below. CVOC concentrations are presented in **Figure 4-6**.

Benzene was detected in the original UST monitoring well, 1817-MW01, at an estimated concentration of 13 µg/L, compared to the 2L standard of 1 µg/L. Benzene was not detected in any of the other site monitoring wells, indicating a very localized presence.

In the shallow monitoring wells, PCE was reported in excess of the NCAC 2L Groundwater Standard (0.7 µg/L) in five of the 14 of the monitoring wells sampled and TCE exceeded the standard in seven wells. PCE was reported in samples from wells SWMU360-MW01 (100 µg/L), SWMU360-MW04 (13 µg/L), SWMU360-MW10 (9 µg/L), SWMU360-MW12 (12µg/L) and 1817-MW01 at a concentration of 3,200 µg/L. Well number 1817MW01 is actually within the former UST area.

Low levels of TCE were reported in samples from locations SWMU360-MW01 (7.1 µg/L), SWMU360-MW02 (4.6J µg/L), SWMU360-MW04 (4.6J µg/L), SWMU360-MW08 (3.5J µg/L), SWMU360-MW10 (3.2J µg/L), and SWMU360-MW-12 (4.1J µg/L). The exception to this trend was at 1817-MW01, with TCE at a concentration of 200J µg/L.

Cis-1,2 DCE exceeded the 2L standard in 1817MW01 (370 µg/L) and vinyl chloride was reported in the sample from SWMU360-MW08 at a concentration of 2.8 µg/L. It should be noted that the sample from 1817MW01 was diluted and the reporting limit for vinyl chloride in that sample was increased to 100 µg/L, indicating that vinyl chloride may have been present at concentrations less than 100 µg/L at that location.

4.2.3.2 Intermediate Aquifer

Groundwater analytical results for the samples from the intermediate aquifer are summarized in **Table 4-6** and CVOC concentrations are illustrated on **Figure 4-7**. CVOCs were detected at concentrations exceeding the comparison criteria. In the intermediate monitoring wells, PCE was reported in excess of the NCAC 2L Groundwater Standards in two of the five monitoring wells. PCE was reported in samples from wells SWMU360-MW01IW and SWMU360-MW10IW at concentrations of 5.2 µg/L, and 9.3 µg/L, respectively. TCE was reported in SWMU360-MW02IW at 4.7J µg/L and in SWMU360-MW10IW at a concentration of 3.3J µg/L. Vinyl Chloride was also reported in SWMU360-MW02IW at 0.58J µg/L.

Table 4-1
Analytes Detected in Near-Surface Soil
SWMU 360 Amended RFI Report
MCB Camp Lejeune

Sample ID	SSLs	PRGs	SWMU360-IS34	SWMU360-IS35	SWMU360-IS36	SWMU360-IS37	SWMU360-IS37-P	SWMU360-IS45
Sample Depth (ft bgs)			1 - 3	1 - 3	1 - 3	1 - 3	1 - 3	1 - 3
Sample Date			12/13/05	12/13/05	12/14/05	12/14/05	12/14/05	12/13/05
Chemical Name								
VOCs (UG/KG)								
Acetone	2810	6000000	21	21 U	17 U	18 U	17 U	19 U
cis-1,2-Dichloroethene	350	150000	6.7	5.3 U	4.3 U	4.4 U	4.3 U	4.8 U
Ethylbenzene	241	20000	4.8 U	5.3 U	1 J	4.4 U	4.3 U	4.8 U
Methylcyclohexane	NC	8700000	1.2 J	5.3 U	4.3 U	4.4 U	4.3 U	4.8 U
Tetrachloroethene	7.42	3400	4.8 U	5.3 U	4.3 U	8.2	5.9	3.1 J
Toluene	7270	520000	9.4	1.6 J	3.1 J	6.9	3.4 J	4.8 U
Xylene, total	4960	420000	4.8 U	3.1 J	7.2	4.4 U	4.3 U	4.8 U
Wet Chemistry								
% Solids	NC	NC	87.8	89.5	90.2	93.6	92.8	88.7
TOC, mg/kg	NC	NC	4,200	NA	1,400	NA	NA	NA

Notes:
U- Analyte not detected
J- Reported value is estimated
NA- Not analyzed
VOCs- Volatile Organic Compounds
NC- No criteria exists
SSLs- Soil Screening Levels
PRGs- Soil Residential Preliminary Remediation Goals
Shading represents exceedance of North Carolina Soil Screening Levels

Table 4-2
Analytes Detected in Subsurface Soil
SWMU 360 Amended RFI Report
MCB Camp Lejeune

Sample ID	SSLs	PRGs	SWMU360-IS34	SWMU360-IS35	SWMU360-IS36	SWMU360-IS37	SWMU360-IS45
Sample Depth (ft bgs)			16 - 18	14 - 16	17 - 19	17 - 19	17 - 19
Sample Date			12/13/05	12/13/05	12/14/05	12/14/05	12/13/05
Chemical Name							
VOCs (UG/KG)							
Acetone	2810	6000000	8.5 J	20 U	17 U	18 U	19 U
cis-1,2-Dichloroethene	350	150000	4.8 U	17	4.3 U	4.4 U	4.8 U
Methylcyclohexane	NC	8700000	1.5 J	5 U	4.3 U	4.4 U	4.8 U
Tetrachloroethene	7.42	3400	3.2 J	140	3.4 J	2.1 J	6.1
Toluene	7270	520000	5.4	2 J	4.3 U	4.4 U	4.8 U
Trichloroethene	18.3	110	4.8 U	7.4	4.3 U	4.4 U	4.8 U
Xylene, total	4960	420000	4.8 U	4.8 J	4.3 U	4.4 U	4.8 U
Wet Chemistry (%)							
% Solids	NC	NC	89.8	91	84.6	90.6	82.5
TOC	NC	NC	NA	91 J	NA	220	NA

Notes:
U- Analyte not detected
J- Reported value is estimated
NA- Not analyzed
VOCs- Volatile Organic Compounds
NC- No criteria exists
Shading represents exceedance of North Carolina Soil Screening Levels
PRGs- Soil Residential Preliminary Remediation Goals
SSLs- Soil Screening Levels

Table 4-3
Analytes Detected in Shallow Level DPT Groundwater
SWMU 360 Amended RFI Report
MCB Camp Lejeune

Sample ID	NC2L GW Criteria	SWMU360-GW37-22-26	SWMU360-GW38-22-26	SWMU360-GW39-22-26	SWMU360-GW40-22-26	SWMU360-GW41-22-26
Well Screen Depth (ft bgs)		22 - 42	22-26	22 - 26	22 - 26	22 - 26
Sample Date		12/14/05	12/15/05	12/15/05	12/15/05	12/14/05
Chemical Name						
VOCs (UG/L)						
1,1-Dichloroethane	70	0.72 J	5 U	5 U	0.56 J	5 U
1,1-Dichloroethene	7	0.97 J	5 U	5 U	0.58 J	5 U
Acetone	700	1.9 J	20 U	20 U	20 U	20 U
Benzene	1	0.2 J	5 U	5 U	5 U	5 U
Chloroform	70	5 U	5 U	5 U	0.32 J	5 U
cis-1,2-Dichloroethene	70	120	1.3 J	0.84 J	24	1.5 J
Ethylbenzene	550	1 J	1.3 J	1.3 J	1 J	5 U
Tetrachloroethene	0.7	180	5 U	5 U	11	1.4 J
Toluene	1000	0.51 J	0.53 J	0.57 J	0.42 J	5 U
trans-1,2-Dichloroethene	100	1.4 J	5 U	5 U	0.52 J	5 U
Trichloroethene	2.8	54	0.59 J	0.38 J	5.6	5 U
Vinyl chloride	0.015	0.51 J	2 U	2 U	2 U	2 U

Notes:
U- Analyte not detected
J- Reported value is estimated
VOCs- Volatile Organic Compounds
Shading represents exceedance of NC2L GW Screening Criteria

Table 4-3
Analytes Detected in Shallow Level DPT Groundwater
SWMU 360 Amended RFI Report
MCB Camp Lejeune

Sample ID	NC2L GW Criteria	SWMU360-GW42-22-26	SWMU360-GW43-22-26	SWMU360-GW44-22-26
Well Screen Depth (ft bgs)		22 - 26	22 - 26	22 - 26
Sample Date		12/14/05	12/15/05	12/15/05
Chemical Name				
VOCs (UG/L)				
1,1-Dichloroethane	70	5 U	5 U	5 U
1,1-Dichloroethene	7	5 U	5 U	5 U
Acetone	700	20 U	20 U	20 U
Benzene	1	5 U	5 U	5 U
Chloroform	70	8.5	0.61 J	1.8 J
cis-1,2-Dichloroethene	70	0.67 J	5 U	5 U
Ethylbenzene	550	5 U	5 U	5 U
Tetrachloroethene	0.7	5 U	0.81 J	3.4 J
Toluene	1000	5 U	5 U	5 U
trans-1,2-Dichloroethene	100	5 U	5 U	5 U
Trichloroethene	2.8	5 U	0.35 J	5 U
Vinyl chloride	0.015	2 U	2 U	2 U

Notes:
U- Analyte not detected
J- Reported value is estimated
VOCs- Volatile Organic Compounds
Shading represents exceedance of NC2L GW Screening Criteria

Table 4-4
Analytes Detected in Intermediate Level DPT Groundwater
SWMU 360 Amended RFI Report
MCB Camp Lejeune

Sample ID	**NC2L GW Criteria**	SWMU360-GW37	SWMU360-GW39	SWMU360-GW40	SWMU360-GW44	SWMU360-GW44-P
Well Screen Depth (ft bgs)		38 - 42	38 - 42	38 - 42	38 - 42	38 - 42
Sample Date		12/14/05	12/15/05	12/15/05	12/15/05	12/15/05
Chemical Name						
VOCs (UG/L)						
Acetone	700	4.9 J	20 U	20 U	20 U	20 U
Benzene	1	5 U	5 U	5 U	0.44 J	5 U
Carbon disulfide	700	5 U	5 U	5 U	5 U	0.38 J
Chloroform	70	5 U	5 U	5 U	0.3 J	5 U
cis-1,2-Dichloroethene	70	5.8	0.43 J	9.5	5 U	5 U
Dichlorodifluoromethane (Freon-12)	1400	5 U	1.9 J	5 U	5 U	5 U
Ethylbenzene	550	0.41 J	0.47 J	0.42 J	0.3 J	5 U
Tetrachloroethene	0.7	0.83 J	5 U	4 J	5 U	5 U
Toluene	1000	5 U	0.32 J	0.3 J	0.54 J	0.2 J
trans-1,2-Dichloroethene	100	0.43 J	5 U	0.4 J	5 U	5 U
Trichloroethene	2.8	0.94 J	5 U	2.4 J	5 U	5 U

Notes:
U- Analyte not detected
J- Reported value is estimated
VOCs- Volatile Organic Compounds
Shading represents exceedance of NC2L GW Screening Criteria

Table 4-5
Analytes Detected in Shallow Monitoring Wells
SWMU 360 Amended RFI Report
MCB Camp Lejeune

Sample ID Sample Date	NC2L GW Criteria	SWMU360-MW01 1/19/06	SWMU360-MW02 1/19/06	SWMU360-MW03 1/19/06	SWMU360-MW04 1/19/06	SWMU360-MW05 1/19/06	SWMU360-MW06 1/19/06	SWMU360-MW07 1/19/06
Chemical Name								
VOCs (UG/L)								
1,1-Dichloroethane	70	0.63 J	0.39 J	5 U	0.53 J	5 U	5 U	5 U
1,1-Dichloroethene	7	0.6 J	0.69 J	5 U	0.67 J	5 U	5 U	5 U
1,4-Dichlorobenzene	1.4	5 U	5 U	5 U	0.2 J	5 U	5 U	5 U
Acetone	700	20 U	20 U	20 U	4.6 J	20 U	1.5 J	20 U
Benzene	1	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	0.56	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon disulfide	700	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	70	5 U	5 U	5 U	5 U	5 U	0.84 J	5 U
cis-1,2-Dichloroethene	70	28	28	1.6 J	25	5 U	5 U	3.9 J
Dichlorodifluoromethane (Freon-12)	1400	5 U	5 U	5 U	0.2 J	5 U	5 U	5 U
Ethylbenzene	550	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	0.7	100	0.46 J	5 U	13	5 U	5 U	5 U
Toluene	1000	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	100	0.57 J	0.67 J	5 U	0.55 J	5 U	5 U	5 U
Trichloroethene	2.8	7.1	4.6 J	0.52 J	4.6 J	5 U	5 U	0.83 J
Vinyl chloride	0.015	2 U	2 U	2 U	2 U	2 U	2 U	2 U

Notes:
U- Analyte not detected
J- Reported value is estimated
VOCs- Volatile Organic Compounds
Shading represents exceedance of NC2L GW Screening Criteria

Table 4-5
Analytes Detected in Shallow Monitoring Wells
SWMU 360 Amended RFI Report
MCB Camp Lejeune

Sample ID	SWMU360-MW08	SWMU360-MW09	SWMU360-MW10	SWMU360-MW10-P	SWMU360-MW11	SWMU360-MW12	1817-MW01	1817-MW01-P	IR78-GW39-06A
Sample Date	1/19/06	1/18/06	1/18/06	1/18/06	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06
Chemical Name									
VOCs (UG/L)									
1,1-Dichloroethane	0.57 J	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1-Dichloroethene	0.86 J	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,4-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Acetone	20 U	20 U	20 U	20 U	20 U	1.9 J	1000 U	1000 U	20 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U	13 J	250 U	5 U
Bromodichloromethane	5 U	5 U	0.5 J	0.54 J	5 U	0.34 J	250 U	250 U	5 U
Carbon disulfide	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Chloroform	5 U	0.98 J	1.5 J	1.7 J	5 U	1 J	250 U	250 U	5 U
cis-1,2-Dichloroethene	30	5 U	14	13	1.2 J	16	370	360	5 U
Dichlorodifluoromethane (Freon-12)	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Tetrachloroethene	5 U	5 U	9	8.8	5 U	12	3,100	3,200	0.69 J
Toluene	5 U	5 U	5 U	5 U	5 U	0.21 J	250 U	250 U	5 U
trans-1,2-Dichloroethene	0.68 J	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Trichloroethene	3.5 J	0.44 J	3.2 J	3 J	0.4 J	4.1 J	200 J	190 J	5 U
Vinyl chloride	2.8	2 U	2 U	2 U	2 U	2 U	100 U	100 U	2 U

Notes:
U- Analyte not detected
J- Reported value is estimated
VOCs- Volatile Organic Compounds
Shading represents exceedance of NC2L GW S

Table 4-6
Analytes Detected in Intermediate Monitoring Wells
SWMU 360 Amended RFI
MCB Camp Lejeune

Sample ID Sample Date	NC2L GW Criteria	SWMU360-MW01IW 1/19/06	SWMU360-MW02IW 1/19/06	SWMU360-MW03IW 1/19/06	SWMU360-MW09IW 1/18/06	SWMU360-MW10IW 1/18/06
Chemical Name						
VOCs (UG/L)						
1,1-Dichloroethane	70	5 U	0.44 J	5 U	5 U	5 U
1,1-Dichloroethene	7	5 U	0.86 J	5 U	5 U	5 U
Acetone	700	20 U	20 U	20 U	12 J	20 U
Bromodichloromethane	0.56	5 U	5 U	5 U	0.34 J	0.35 J
Chloroform	70	5 U	5 U	5 U	3.7 J	1.6 J
cis-1,2-Dichloroethene	70	5 U	31	5 U	5 U	16
Tetrachloroethene	0.7	5.2	5 U	5 U	5 U	9.3
Toluene	1000	5 U	5 U	5 U	1.2 J	0.28 J
trans-1,2-Dichloroethene	100	5 U	0.75 J	5 U	5 U	0.56 J
Trichloroethene	2.8	5 U	4.7 J	5 U	5 U	3.3 J
Vinyl chloride	0.015	2 U	0.58 J	2 U	2 U	2 U

Notes:
U- Analyte not detected
J- Reported value is estimated
VOCs- Volatile Organic Compounds
Shading represents exceedance of NC2L GW Screening Criteria

Station	SWMU360-IS35
Depth (ft bgs)	1-3
Date	12/13/2005
VOCs (UG/KG)	
PCE	<5.3
TCE	<5.3
CIS-1,2-DCE	<5.3

Station	SWMU360-IS45
Depth (ft bgs)	1-3
Date	12/14/2005
VOCs (UG/KG)	
PCE	3.1 J
TCE	<4.8
CIS-1,2-DCE	<4.8

Station	SWMU360-IS36
Depth (ft bgs)	1-3
Date	12/14/2005
VOCs (UG/KG)	
PCE	<4.3
TCE	<4.3
CIS-1,2-DCE	<4.3

Station	SWMU360-IS34
Depth (ft bgs)	1-3
Date	12/13/2005
VOCs (UG/KG)	
PCE	<4.8
TCE	<4.8
CIS-1,2-DCE	6.7

Station	SWMU360-IS37
Depth (ft bgs)	1-3
Date	12/14/2005
VOCs (UG/KG)	
PCE	8.2
TCE	<4.4
CIS-1,2-DCE	<4.4

1880 1808 S1806 1810 1819 1817 1896 S1853 1895 1854 1855 1860 524 1828 1827 1826 1841 1839 S1852 S1842 S1892 S578 575 HP502

IS45 IS36 IS35 IS34 IS33 IS37 IS38 IS39 IS42 IS43 IS41 IS40 IS44

O STREET McHUGH BOULEVARD DUNCAN STREET

Legend

- DPT Soil and Groundwater Sample Location
- Fence
- Gate
- Wall

J- Reported value is estimated
PCE- Tetrachloroethene
TCE- Trichloroethene
cis 1,2-DCE- Cis 1,2-Dichloroethene
CVOCs- Volatile Organic Compounds
Bold Red indicates exceedance of NC2LGW screening criteria

SSL - Soil Screening Level for migration to groundwater

N

0 125 250 Feet

Figure 4-1
Near Surface Soil CVOC Concentrations
SWMU 360
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

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File Path: X:\USNavFaceNGCom\315007CampLejeune\Projects\SWMU360\Figure 4-1 Surface VOCs.mxd

Station	SWMU360-IS45
Depth (ft bgs)	17 - 19
Date	12/13/05
VOCs (UG/KG)	
PCE	6.1
TCE	<4.8
CIS-1,2-DCE	<4.8

Station	SWMU360-IS35
Depth (ft bgs)	14 - 16
Date	12/13/05
VOCs (UG/KG)	
PCE	140
TCE	7.4
CIS-1,2-DCE	17

Station	SWMU360-IS36
Depth (ft bgs)	17 - 19
Date	12/14/05
VOCs (UG/KG)	
PCE	3.4 J
TCE	<4.3
CIS-1,2-DCE	<4.3

Station	SWMU360-IS34
Depth (ft bgs)	16 - 18
Date	12/13/05
VOCs (UG/KG)	
PCE	3.2 J
TCE	<4.8
CIS-1,2-DCE	<4.8

Station	SWMU360-IS37
Depth (ft bgs)	17 - 19
Date	12/14/05
VOCs (UG/KG)	
PCE	2.1 J
TCE	<4.4
CIS-1,2-DCE	<4.4

Screening Criteria	SSLs	PRGs
PCE	7.42	3,400
TCE	18.3	110
CIS-1,2-DCE	350	150,000

Legend

- DPT Soil and Groundwater Sample Location
- Fence
- Gate
- Wall

J- Reported value is estimated
PCE- Tetrachloroethene
TCE- Trichloroethene
cis 1,2-DCE- Cis 1,2-Dichloroethene
CVOCs- Volatile Organic Compounds
Bold Red indicates exceedance of NC2LGW screening criteria

SSL - Soil Screening Level for migration to groundwater

N

0 125 250 Feet

Figure 4-2
14' to 19' Depth Subsurface Soil CVOC Concentrations
SWMU 360
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

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File Path: X:\USNavFaceNGCom\315007CampLejeune\Projects\SWMU360\Figure 4-2 Subsurface VOCs.mxd

360-IS45
12/13/05
1'-3' 3.1J
17'-19' 6.1

360-SB07	
6/19/03	
3'-5'	44
7'-9'	13
15'-17'	64
17'-19'	82

360-SB11	
6/20/03	
11'-13'	4
15'-17'	3
17'-19'	6

360-SB10	
6/22/03	
1'-3'	7
3'-5'	3
7'-9'	2
13'-15'	6
17'-19'	5

360-SB06	
6/20/03	
1'-3'	118
3'-5'	20
7'-9'	19

DUNCAN STREET

360-SB01
6/19/03
17'-19' 6

360-IS35
12/13/05
1'-3' 5.3 U
14'-16' 140

TW04
3/25/02
11'-13' 10

360-IS36
12/14/05
1'-3' 4.3U
17'-19' 3.4J

360-SB12
6/20/03
7'-9' 2U
9'-11' 2U

360-SB05	
6/19/03	
7'-9'	46
11'-13'	5
15'-17'	64

360-SB02	
6/19/03	
1'-3'	6
3'-5'	5

360-IS34
12/13/05
1'-3' 4.8U
16'-18' 3.2J

360-SB04
6/19/03
3'-5' 11U
15'-17' 34

360-SB13
6/20/03
7'-9' 11U

360-SB16
6/24/03
17'-19' 11U

360-IS37
12/14/05
1'-3' 8.2
17'-19' 2.1J

360-SB15
6/20/03
9'-11' 11U

360-SB14
6/20/03
3'-5' 2U
7'-9' 2U
11'-13' 17
15'-17' 2

LEGEND:

J = ESTIMATED CONCENTRATION
U = NOT DETECTED, NUMBER SHOWN IS THE LABORATORY DETECTION LIMIT
EXCEEDS NC HWS SOIL SCREENING LEVEL (7.42 ug/kg)

40 0 20 40
1 inch = 40 ft.

FIGURE 4-3
PCE CONCENTRATIONS IN SOIL
SMWU 360 AMENDED RFI
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

P:\EBL\navyClean\CAMPLEJCADD\SWMU 360\CADD\Figure4-3.dwg

SOURCE: BAKER, 2005

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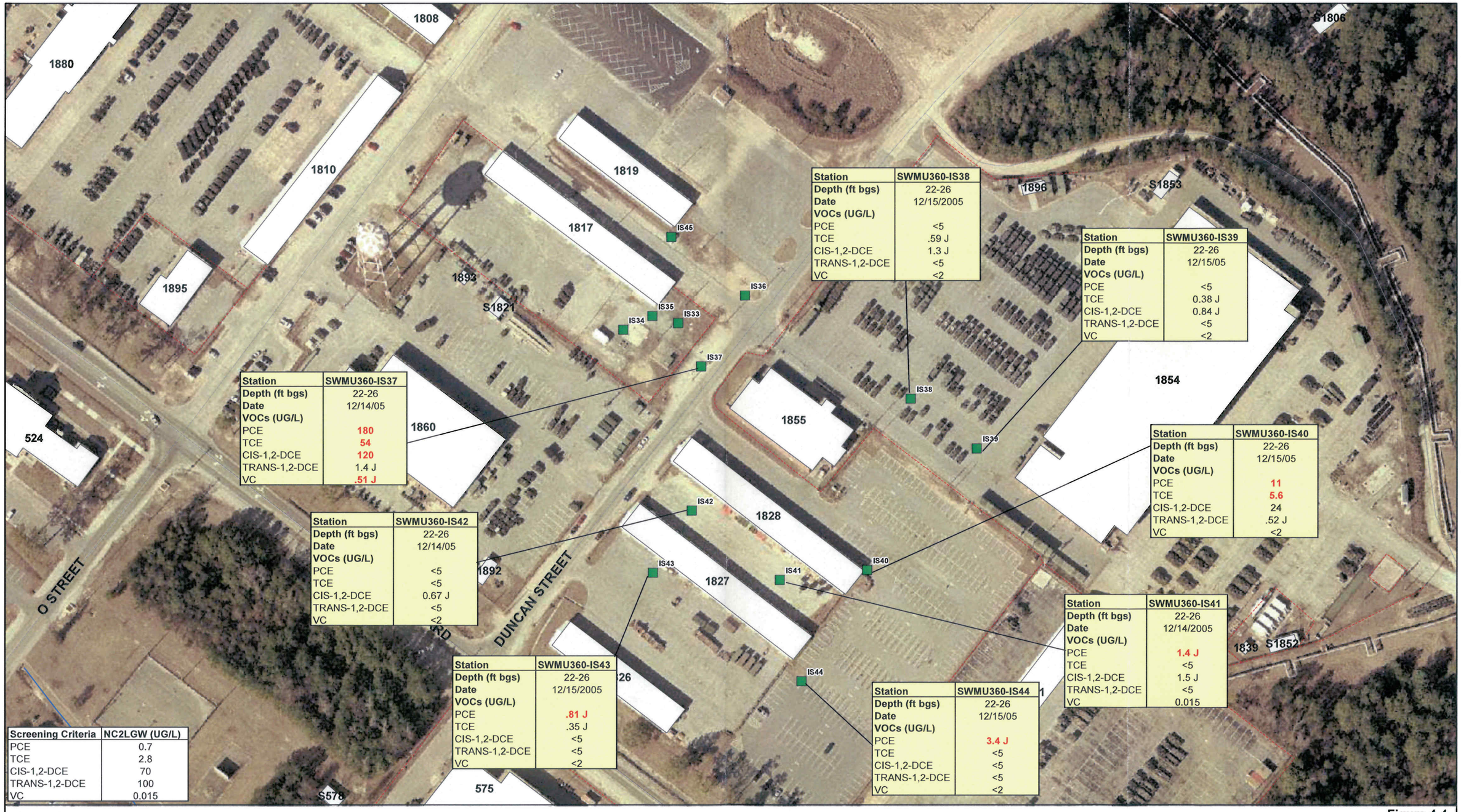

Station	SWMU360-IS38
Depth (ft bgs)	22-26
Date	12/15/2005
VOCs (UG/L)	
PCE	<5
TCE	.59 J
CIS-1,2-DCE	1.3 J
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-IS39
Depth (ft bgs)	22-26
Date	12/15/05
VOCs (UG/L)	
PCE	<5
TCE	0.38 J
CIS-1,2-DCE	0.84 J
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-IS37
Depth (ft bgs)	22-26
Date	12/14/05
VOCs (UG/L)	
PCE	180
TCE	54
CIS-1,2-DCE	120
TRANS-1,2-DCE	1.4 J
VC	.51 J

Station	SWMU360-IS40
Depth (ft bgs)	22-26
Date	12/15/05
VOCs (UG/L)	
PCE	11
TCE	5.6
CIS-1,2-DCE	24
TRANS-1,2-DCE	.52 J
VC	<2

Station	SWMU360-IS42
Depth (ft bgs)	22-26
Date	12/14/05
VOCs (UG/L)	
PCE	<5
TCE	<5
CIS-1,2-DCE	0.67 J
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-IS41
Depth (ft bgs)	22-26
Date	12/14/2005
VOCs (UG/L)	
PCE	1.4 J
TCE	<5
CIS-1,2-DCE	1.5 J
TRANS-1,2-DCE	<5
VC	0.015

Station	SWMU360-IS43
Depth (ft bgs)	22-26
Date	12/15/2005
VOCs (UG/L)	
PCE	.81 J
TCE	.35 J
CIS-1,2-DCE	<5
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-IS44
Depth (ft bgs)	22-26
Date	12/15/05
VOCs (UG/L)	
PCE	3.4 J
TCE	<5
CIS-1,2-DCE	<5
TRANS-1,2-DCE	<5
VC	<2

Screening Criteria	NC2LGW (UG/L)
PCE	0.7
TCE	2.8
CIS-1,2-DCE	70
TRANS-1,2-DCE	100
VC	0.015

Legend

- DPT Soil and Groundwater Sample Location
- Fence
- Gate
- Wall

J- Reported value is estimated
PCE- Tetrachloroethene
TCE- Trichloroethene
cis 1,2-DCE- Cis 1,2-Dichloroethene
TRANS-1,2-DCE- Trans-1,2-Dichloroethene
VC- Vinyl Chloride
CVOCs- Volatile Organic Compounds
Bold Red indicates exceedance of NC2LGW screening criteria

N

0 125 250 Feet

Figure 4-4
CVOC Concentrations in Shallow Groundwater During DPT Sampling
SWMU 360
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

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Figure 4-5
CVOC Concentrations in Intermediate Groundwater During DPT Sampling
SWMU 360
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

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File Path: X:\USNavFaceNGCom\315007CampLejeune\Projects\SWMU360\Figure 4-5 Intermediate GW VOCs.mxd

Station	SWMU360-MW08
Date	1/19/2006
CVOCs (UG/L)	
PCE	<5
TCE	3.5 J
CIS-1,2-DCE	30
TRANS-1,2-DCE	0.68 J
VC	2.8

Station	1817-MW01
Date	1/19/2006
CVOCs (UG/L)	
PCE	3,200
TCE	200 J
CIS-1,2-DCE	370
TRANS-1,2-DCE	<250
VC	<100

Station	SWMU360-MW07
Date	1/19/2006
CVOCs (UG/L)	
PCE	<5
TCE	0.83 J
CIS-1,2-DCE	3.9 J
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW01
Date	1/19/2006
CVOCs (UG/L)	
PCE	100
TCE	7.1
CIS-1,2-DCE	28
TRANS-1,2-DCE	0.57 J
VC	<2

Station	SWMU360-MW06
Date	1/19/2006
CVOCs (UG/L)	
PCE	<5
TCE	<5
CIS-1,2-DCE	<5
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW11
Date	1/19/2006
CVOCs (UG/L)	
PCE	<5
TCE	0.4 J
CIS-1,2-DCE	1.2 J
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW02
Date	1/19/2006
CVOCs (UG/L)	
PCE	0.46 J
TCE	4.6 J
CIS-1,2-DCE	28
TRANS-1,2-DCE	0.67 J
VC	<2

Station	SWMU360-MW03
Date	1/19/2006
CVOCs (UG/L)	
PCE	<5
TCE	0.52 J
CIS-1,2-DCE	1.6 J
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW04
Date	1/19/2006
CVOCs (UG/L)	
PCE	13
TCE	4.6 J
CIS-1,2-DCE	25
TRANS-1,2-DCE	0.55 J
VC	<2

Station	SWMU360-MW05
Date	1/19/2006
CVOCs (UG/L)	
PCE	<5
TCE	<5
CIS-1,2-DCE	<5
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW09
Date	1/18/2006
CVOCs (UG/L)	
PCE	<5
TCE	0.44 J
CIS-1,2-DCE	<5
TRANS-1,2-DCE	<5
VC	<2

Station	IR78-GW39
Date	1/19/2006
CVOCs (UG/L)	
PCE	.69 J
TCE	<5
CIS-1,2-DCE	<5
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW12
Date	1/19/2006
CVOCs (UG/L)	
PCE	12
TCE	4.1 J
CIS-1,2-DCE	16
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW10[1]
Date	1/18/2006
CVOCs (UG/L)	
PCE	9
TCE	3.2 J
CIS-1,2-DCE	14
TRANS-1,2-DCE	<5
VC	<2

1880, 1810, 1819, 1817, 1896, S1853, 1895, 1893, S1821, 1817-MW01, SWMU360-MW01IW, SWMU360-MW02IW, 1854, 1855, 1860, 524, 1828, SWMU360-MW03IW, 1827, S1892, DUNCAN STREET, O STREET, SWMU360-MW09IW, SWMU360-MW10IW, 1839, S1852, 1841, S1842, 1826, HP502, S51, 575, IR78-GW39

Legend

- Monitoring Well Location
- Fence
- Gate
- Wall

J- Reported value is estimated
PCE- Tetrachloroethene
TCE- Trichloroethene
cis 1,2-DCE- Cis 1,2-Dichloroethene
TRANS-1,2-DCE- Trans-1,2-Dichloroethene
VC- Vinyl Chloride
CVOCs- Chlorinated Volatile Organic Compounds
Bold Red indicates exceedance of NC2LGW screening criteria

N

0 125 250 Feet

Figure 4-6
CVOC Concentrations in Groundwater in the Shallow Aquifer
SWMU 360
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

CH2MHILL

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Station	SWMU360-MW01IW
Date	1/19/2006
CVOCs (UG/KG)	
PCE	5.2
TCE	<5
cis 1,2-DCE	<5
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW03IW
Date	1/19/2006
CVOCs (UG/KG)	
PCE	<5
TCE	<5
cis 1,2-DCE	<5
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW02IW
Date	1/19/2006
CVOCs (UG/KG)	
PCE	<5
TCE	4.7 J
cis 1,2-DCE	31
TRANS-1,2-DCE	0.75 J
VC	.58 J

Station	SWMU360-MW09IW
Date	1/18/2006
CVOCs (UG/KG)	
PCE	<5
TCE	<5
cis 1,2-DCE	<5
TRANS-1,2-DCE	<5
VC	<2

Station	SWMU360-MW10IW
Date	1/19/2006
CVOCs (UG/KG)	
PCE	9.3
TCE	3.3 J
cis 1,2-DCE	16
TRANS-1,2-DCE	0.56 J
VC	<2

Screening Criteria	NC2LGW (UG/L)
PCE	0.7
TCE	2.8
cis 1,2-DCE	70
TRANS-1,2-DCE	100
VC	0.015

Legend

- Monitoring Well Location
- Fence
- Gate
- Wall

J- Reported value is estimated
PCE- Tetrachloroethene
TCE- Trichloroethene
cis 1,2-DCE- Cis 1,2-Dichloroethene
TRANS-1,2-DCE- Trans-1,2-Dichloroethene
VC- Vinyl Chloride
CVOCs- Chlorinated Volatile Organic Compounds
Bold Red indicates exceedance of NC2LGW screening criteria

N

0 125 Feet

Figure 4-7
CVOC Concentrations in Groundwater in the Intermediate Aquifer
SWMU 360
Amended RFI Report
Marine Corps Base, Camp Lejeune, North Carolina

CH2MHILL

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5.0 Evaluations and Conclusions

5.1 Evaluations

5.1.1 Nature and extent of CVOCs

It is apparent that the sources of the both the PCE and the petroleum hydrocarbon contamination in soil and groundwater were located near the former UST. Monitoring well 1817-MW01, located within the former UST pit, contains the highest concentrations of PCE and degradation products. Although another upgradient source of TCE is evident, the majority of the TCE in groundwater at the UST location may be assumed to have been associated with the release at the SWMU, as a degradation product within the groundwater. The fact that there is very little TCE in site soil above the groundwater indicates that TCE was not a major component of the release. It is also apparent that reductive dechlorination of the PCE is not occurring at a high rate in the soil above the water table.

It appears that a preferential groundwater pathway for the PCE plume is relatively narrow, extending beneath Building 1828 and southeast of the UST location. In this area, PCE concentrations exceed TCE and DCE, while in upgradient and side-gradient areas, the daughter product DCE has successively higher concentrations than the TCE. This is an indication of a continuing source of PCE, the vadose zone soils at SWMU360. In situ degradation has been occurring, however, outside of the narrow PCE plume pathway, as evidenced by the higher ratio of DCE to TCE to PCE.

5.1.2 Nature and Extent of Petroleum Hydrocarbons

Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations are all relatively low in the soil and groundwater, with the highest detect estimated at 13 µg/L within monitoring well 1817-MW01. The benzene concentration exceeded the NCAC 2L standard; no other exceedances of petroleum hydrocarbons were noted at SWMU 360. Because of the limited number of detects, it is concluded that there is no BTEX plume at this site.

5.2 Human Health Risk Assessment Review

An HHRA was included as part of the RFI for SWMU 360 at Camp Lejeune. That analysis concluded that constituents in groundwater, primarily chlorinated solvents, are above levels that may suggest potential future adverse impacts if used as a source of potable water. No restrictions on exposures to soil were identified. Additional data were collected to better delineate the concentrations of VOCs at the site. The additional data collected in 2005-2006 were reviewed to determine if these results would modify the conclusions to the HHRA.

5.2.1 Soils

Based on available data, the HHRA concluded that surface and subsurface soils do not pose a current risk for military personnel, nor a hazard for future construction workers or residents.

No additional surface soils samples were collected. Eleven subsurface soil samples were collected in December 2005 and analyzed for VOCs. As shown in **Table 5-1**, the additional subsurface soil data are compared to the screening toxicity values using the protocol as summarized in the risk assessment. In the HHRA, subsurface soils were evaluated for samples collected from 1 to 13 feet bgs, however, the following screening includes samples below 13 feet.

TABLE 5-1
Soil Data Summary, December 2005
SWMU 360 Amended RFI Report
Marine Corps Base Camp Lejeune

Chemical	Frequency	Max Value		Screening Toxicity Value*		Chemical of Potential Concern?
Acetone	2 / 11	21.0		1412657	nc	No
cis-1,2-Dichloroethene	2 / 11	17.0		4294	nc	No
Ethylbenzene	1 / 11	1.0	J	395000	sat	No
Methylcyclohexane	2 / 11	1.5	J	259106	nc	No
Tetrachloroethene	8 / 11	140.0		484	ca	No
Toluene	7 / 11	9.4		520000	sat	No
Trichloroethene	1 / 11	7.4		53	ca	No
Xylene, total	3 / 11	7.2		27063	nc	No

Notes:

J- Reported value is estimated
*Screening toxicity values derived from USEPA Region IX PRG Table, Version 9, October 2004 for future residential use. Noncarcinogenic criteria (nc) were divided by 10 to account for potential additive effects. Carcinogenic PRGs (ca) and soil saturation (sat) values were not adjusted.

All values in µg/kg

Eight VOCs were detected, and all were below screening toxicity values based on the USEPA Region IX PRGs. This screening, consistent with the approach used in the HHRA, supports the initial conclusions that soils do not pose a current or future risk or hazard for contact with these soils.

5.2.2 Groundwater

Several chemicals of potential concern were identified for groundwater in the HHRA. The primary contaminants of concern (COCs) were chlorinated solvents: TCE and PCE in shallow groundwater and TCE in the deeper aquifer. In addition, two other constituents that were identified as COCs in shallow groundwater were not further investigated:

- Arsenic was identified as exceeding the risk based screening values and contributing to cumulative risk, however, the maximum detected concentration of 2.6 J µg/L in groundwater is below the maximum contaminant level (MCL) of 10 µg/L and the NCAC 2L standard of 50 µg/L. Therefore, no further evaluation of this chemical was recommended.

- Similarly, heptachlor epoxide was detected above the MCL (0.2 µg/L) and the 2L standard of 0.0038 µg/L at one of four locations with a reported concentration of 0.45 µg/L. This exceedance occurred in a sample where the highest concentration of TCE

was reported. It was concluded that this constituent is localized, and not a primary site related chemical.

During 2005 and 2006, 35 additional groundwater samples were collected and analyzed for VOCs. These results are summarized in **Table 5-2**. Sixteen VOCs were detected in one or more of these samples. Of these sixteen chemicals, the maximum detected concentration in eleven of these samples was below the 2L standards in all samples.

TABLE 5-2
Additional Groundwater Monitoring Result Screening
SWMU 360 Amended RFI Report
Marine Corps Base, Camp Lejeune

Chemical Name	2L	USEPA Region IX Tap Water PRG		Summary of Groundwater VOC Results 2005-2006 Freq	Max Value		Potential Groundwater COPC?
Tetrachloroethene	0.7	0.104	ca	18 / 35	3,200		Yes
Trichloroethene	2.8	0.028	ca	23 / 35	200	J	Yes
Benzene	1	0.354	ca	3 / 35	13	J	Yes
cis-1,2-Dichloroethene	70	61	nc	24 / 35	370		Yes
Vinyl chloride	0.015	0.020	ca	3 / 35	2.8		Yes
1,1-Dichloroethane	70	811	nc	7 / 35	0.72	J	No
1,1-Dichloroethene	7	339	nc	7 / 35	0.97	J	No
1,4-Dichlorobenzene	1.4	0.502	ca	1 / 35	0.2	J	No
Acetone	700	5475	nc	6 / 35	12	J	No
Bromodichloromethane	0.56	0.181	ca	5 / 35	0.54	J	No*
Carbon disulfide	700	1043	nc	1 / 35	0.38	J	No
Chloroform	70	0.166	ca	12 / 35	8.5		No*
Dichlorodifluoromethane (Freon-12)	1400	395	nc	2 / 35	1.9	J	No
Ethylbenzene	550	1340	nc	9 / 35	1.3	J	No
Toluene	1000	723	nc	12 / 35	1.2	J	No
trans-1,2-Dichloroethene	100	122	nc	10 / 35	1.4	J	No

Notes:
All results in µg/L
J- Reported value is estimated
VOCs- Volatile Organic Compounds
*Chloroform and bromodichloromethane are trihalomethanes that are above the PRG, but below the NC 2L standard and not considered site related

In the 35 samples, TCE and PCE were most frequently detected (23 and 24 detections respectively). These COCs were identified in the HHRA and remain the target chemicals for further groundwater evaluations. The maximum concentration of TCE was 200 J µg/L,

higher than the maximum of 75 µg/L used in the HHRA. Similarly, the maximum PCE concentration of 3,200 µg/L is higher than 120 µg/L used in the HHRA.

The additional data suggest that other COPCs are present in groundwater. These include benzene, cis-1,2-DCE, and vinyl chloride.

- Benzene was detected in three samples, but exceeded the 2L standard in only one sample, the location with the highest TCE/PCE concentration.
- TCE/PCE degradation products
    - cis-1,2-DCE was identified as a COPC in the HHRA, but was not identified as a COC for future potable use of groundwater. Although it was detected frequently (24/35 samples) in the more recent samples, it exceeded the 2L standard in only two of the 35 samples. This again was at locations with elevated TCE and PCE concentrations. This parameter may continue to be evaluated in monitoring the spatial/temporal patterns of chlorinated solvents, but at the current time, concentrations infrequently exceed the 2L standard and average concentrations remain below this value.
    - Vinyl chloride is also an anaerobic biodegradation product of TCE/PCE. It was detected in 3 of the 35 samples, and exceeded the MCL in one of these samples. The 2L standard is below the detection limit for this constituent.

These data support the conclusion in the HHRA that future potable use of groundwater is likely to pose risks, primarily due to the presence of TCE/PCE. The additional data show higher concentrations of these COCs than previously measured, and also suggest that anaerobic biodegradation products may form that may contribute to overall risks.

5.2.3 HHRA Review Conclusions

The HHRA conclusions regarding potential exposure to subsurface soils do not change with the additional data collected. The overall conclusion that future potable use of groundwater should be restricted is not changed. The data suggest that with the additional delineation, risks for long term potable use of water at the source would be higher than previously estimated, and that anaerobic biodegradation products may also contribute to overall estimates of risk.

5.3 Amended RFI Conclusions

The only contaminant of concern exceeding the SSLs in the soil at SWMU 360 is PCE. Soil contamination at SWMU 360 has been adequately delineated. Impacted soil is confined to an irregularly shaped area of approximately 165 ft from east to west by 205 ft north to south. The impacted soil is located around the former UST area and extends underneath the southeastern end of Building 1817. Groundwater in the area is approximately 20 feet below the ground surface.

The COCs in groundwater are PCE and TCE. Concentrations of daughter products cis-1,2-DCE (one location) and vinyl chloride (one location) have also been reported in the groundwater at concentrations exceeding the 2L groundwater quality standards, but are not considered to be COCs for this site.

The horizontal extent of groundwater contamination has been adequately defined in the sidegradient directions (northeast and southwest), but not in the upgradient (northwest) and downgradient (southeast) directions. TCE and vinyl chloride exceed the groundwater quality standards in SWMU360-MW08, located approximately 370 feet upgradient of the source area. This indicates an upgradient source for some of the contaminants reported at SWMU 360.

The vertical extent of groundwater contamination has not been completely defined, as evidenced by exceedances of the groundwater quality standards in three of the five intermediate depth wells. Exceedances of PCE (SWMU360-MW01IW and MW10IW), TCE (SWMU360-MW02IW and MW10IW) and vinyl chloride SWMU360-MW02IW) were reported. These wells are screened at a depth of 40 to 45 feet bgs.

Benzene was also reported in shallow monitoring well 1817-MW01 at an estimated concentration of 13J µg/L. Several additional petroleum constituents and VOCs were detected at concentrations below all applicable regulatory standards. These contaminants are not considered to be COCs for this site. The benzene is located within the highest PCE concentrations, and contributes a minor risk compared to the PCE, which is considered more toxic.

The existing HHRA (Baker 2005) was re-evaluated using the current soil and groundwater data in addition to the data previously collected. The conclusions regarding exposure to soil and groundwater at the site have not changed; there is unacceptable risk associated with residential exposure to site groundwater.

5.4 Recommendations

The subsurface soil at SWMU 360 is a potential continuing source of PCE for the groundwater. CH2M HILL is currently performing a Corrective Measures Study (CMS) to evaluate methods for remediating the soil contamination. Results of the CMS will be presented under separate cover.

Additional assessment of the horizontal and vertical extent of the groundwater plume should be undertaken. Horizontal delineation is complete in the sidegradient directions, but is lacking in the upgradient and downgradient directions.

6.0 References

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Appendix A

Analytical Results from
Final SWMU 360 RCRA Facility Investigation Report
Baker, October 2005

SURFACE SOILS ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-SB01-00	SWMU360-SB02-00	SWMU360-SB03-00	SWMU360-SB04-00	SWMU360-SB05-00	SWMU360-SB06-00	SWMU360-SB07-00
Sample Date	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
Depth Range	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Volatiles (ug/kg)							
1,1-DCE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Cis-1,2-DCE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U
PCE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
TCE	2 U	2 U	2 U	2 U	2 U	2 U	2 U
trans 1,2-DCE	2 U	2 U	2 U	2 U	2 U	2 U	2 U

SURFACE SOILS ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-SB08-00	SWMU360-SB09-00	SWMU360-SB10-00	SWMU360-SB11-00	SWMU360-SB12-00	SWMU360-SB15-00
Sample Date	06-20-2003	06-20-2003	06-22-2003	06-20-2003	06-20-2003	06-20-2003
Depth Range	0-1	0-1	0-1	0-1	0-1	0-1
Volatiles (ug/kg)						
1,1-DCE	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
Cis-1,2-DCE	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
PCE	2 U	2 U	2 U	2 U	2 U	2 U
TCE	2 U	2 U	2 U	2 U	2 U	2 U
trans 1,2-DCE	2 U	2 U	2 U	2 U	2 U	2 U

SUBSURFACE SOILS ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-SB01-01	SWMU360-SB01-02	SWMU360-SB01-04	SWMU360-SB01-07	SWMU360-SB01-09	SWMU360-SB02-01
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
Depth Range	1-3	3-5	7-9	13-15	17-19	1-3
Volatiles (ug/kg)						
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	2 U	2 U	2 U	6	6
Trichloroethene	2 U	3	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U

SUBSURFACE SOILS ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-SB02-02	SWMU360-SB02-05	SWMU360-SB02-09	SWMU360-SB03-01	SWMU360-SB03-02	SWMU360-SB03-05
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
Depth Range	3-5	9-11	17-19	1-3	3-5	9-11
Volatiles (ug/kg)						
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	5	2 U	2 U	2 U	2 U	2 U
Trichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U

SUBSURFACE SOILS ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-SB03-10	SWMU360-SB04-02	SWMU360-SB04-06	SWMU360-SB04-08	SWMU360-SB04-10	SWMU360-SB05-01
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
Depth Range	19-21	3-5	11-13	15-17	19-21	1-3
Volatiles (ug/kg)						
1,1-Dichloroethene	2	2 U	2 U	2 U	9	2 U
Benzene	2 U	2 U	5	5	2 U	2 U
cis-1,2-Dichloroethene	2 U	23	213	237	12	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	3	2 U	2 U	34	22	2 U
Trichloroethene	2 U	2 U	2 U	3	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	3	4	2 U	2 U

SUBSURFACE SOILS ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-SB05-04	SWMU360-SB05-06	SWMU360-SB05-08	SWMU360-SB06-01	SWMU360-SB06-02	SWMU360-SB06-04
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
Depth Range	7-9	11-13	15-17	1-3	3-5	7-9
Volatiles (ug/kg)						
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	3
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	6	2 U	8	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	46	5	64	118	20	19
Trichloroethene	3	2 U	4	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U

SUBSURFACE SOILS ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-SB06-06	SWMU360-SB06-10	SWMU360-SB06-11	SWMU360-SB07-02	SWMU360-SB07-04	SWMU360-SB07-06
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
Depth Range	11-13	19-21	21-23	3-5	7-9	11-13
Volatiles (ug/kg)						
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	9	8	3	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	105	84	44	13	2 U
Trichloroethene	2 U	5	4	23	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U

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Site Sample I.D.	SWMU360-SB07-08	SWMU360-SB07-09	SWMU360-SB07-12	SWMU360-SB08-01	SWMU360-SB08-02	SWMU360-SB08-04
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-19-2003	06-19-2003	06-19-2003	06-20-2003	06-20-2003	06-20-2003
Depth Range	15-17	17-19	23-25	1-3	3-5	7-9
Volatiles (ug/kg)						
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	10	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	64	82	38	2 U	2 U	2 U
Trichloroethene	2	3	3	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U

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Site Sample I.D.	SWMU360-SB08-06	SWMU360-SB08-10	SWMU360-SB09-04	SWMU360-SB09-05	SWMU360-SB09-07	SWMU360-SB09-09
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003
Depth Range	11-13	19-21	7-9	9-11	13-15	17-19
Volatiles (ug/kg)						
1,1-Dichloroethene	2	2 U	3	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Trichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U

SUBSURFACE SOILS ANALYTICAL RESULTS - MOBILE LAB DATA
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Site Sample I.D.	SWMU360-SB10-01	SWMU360-SB10-02	SWMU360-SB10-04	SWMU360-SB10-07	SWMU360-SB10-09	SWMU360-SB11-03
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-22-2003	06-22-2003	06-22-2003	06-22-2003	06-22-2003	06-20-2003
Depth Range	1-3	3-5	7-9	13-15	17-19	5-7
Volatiles (ug/kg)						
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	7	3	2	6	5	2 U
Trichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U

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Site Sample I.D.	SWMU360-SB11-06	SWMU360-SB11-08	SWMU360-SB11-09	SWMU360-SB12-04	SWMU360-SB12-05	SWMU360-SB13-02
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003
Depth Range	11-13	15-17	17-19	7-9	9-11	3-5
Volatiles (ug/kg)						
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	4	3	6	2 U	2 U	2 U
Trichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U

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Site Sample I.D.	SWMU360-SB13-04	SWMU360-SB13-05	SWMU360-SB14-02	SWMU360-SB14-04	SWMU360-SB14-06	SWMU360-SB14-08
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003
Depth Range	7-9	9-11	3-5	7-9	11-13	15-17
Volatiles (ug/kg)						
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	12	3	1
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	2 U	2 U	2 U	17	2
Trichloroethene	2 U	2 U	2 U	3	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2	2 U	2 U

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Site Sample I.D.	SWMU360-SB14-10	SWMU360-SB15-02	SWMU360-SB15-04	SWMU360-SB15-05	SWMU360-SB15-06	SWMU360-SB15-10
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003
Depth Range	19-21	3-5	7-9	9-11	11-13	19-21
Volatiles (ug/kg)						
1,1-Dichloroethene	2	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	2 U	2 U	2 U	2 U	2 U
Trichloroethene	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U

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Site Sample I.D.	SWMU360-SB16-02	SWMU360-SB16-03	SWMU360-SB16-05	SWMU360-SB16-07	SWMU360-SB16-09
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing
Sample Date	06-24-2003	06-24-2003	06-24-2003	06-24-2003	06-24-2003
Depth Range	3-5	5-7	9-11	13-15	17-19
Volatiles (ug/kg)					
1,1-Dichloroethene	2 U	2 U	2 U	2 U	5
Benzene	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	2 U	2 U	2 U	2 U
Trichloroethene	2 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U

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SAMPLE ID	SWMU360-SB01-03	SWMU360-SB01-05	SWMU360-SB01-09	SWMU360-SB02-02	SWMU360-SB02-05	SWMU360-SB02-09
SAMPLE DATE	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
DEPTH RANGE	5-7	9-11	17-19	3-5	9-11	17-19
VOLATILES (ug/kg)						
1,1,1-Trichloroethane	NA	NA	12 U	NA	NA	11 U
1,1,2,2-Tetrachloroethane	NA	NA	12 U	NA	NA	11 U
1,1,2-Trichloroethane	NA	NA	12 U	NA	NA	11 U
1,1,2-Trichlorotrifluoroethane	NA	NA	12 U	NA	NA	11 U
1,1-Dichloroethane	NA	NA	12 U	NA	NA	11 U
1,1-Dichloroethene	NA	NA	12 U	NA	NA	11 U
1,2,4-Trichlorobenzene	NA	NA	12 U	NA	NA	11 U
1,2-Dibromo-3-Chloropropane	NA	NA	12 U	NA	NA	11 U
1,2-Dibromoethane	NA	NA	12 U	NA	NA	11 U
1,2-Dichlorobenzene	NA	NA	12 U	NA	NA	11 U
1,2-Dichloroethane	NA	NA	12 U	NA	NA	11 U
1,2-Dichloropropane	NA	NA	12 U	NA	NA	11 U
1,3-Dichlorobenzene	NA	NA	12 U	NA	NA	11 U
1,4-Dichlorobenzene	NA	NA	12 U	NA	NA	11 U
2-Butanone	NA	NA	12 U	NA	NA	11 U
2-Hexanone	NA	NA	12 U	NA	NA	11 U
4-Methyl-2-Pentanone	NA	NA	12 U	NA	NA	11 U
Acetone	NA	NA	16 U	NA	NA	11 U
Benzene	NA	NA	12 U	NA	NA	11 U
Bromodichloromethane	NA	NA	12 U	NA	NA	11 U
Bromoform	NA	NA	12 U	NA	NA	11 U
Bromomethane	NA	NA	12 U	NA	NA	11 U
Carbon Disulfide	NA	NA	12 U	NA	NA	11 U
Carbon Tetrachloride	NA	NA	12 U	NA	NA	11 U
Chlorobenzene	NA	NA	12 U	NA	NA	11 U
Chloroethane	NA	NA	12 U	NA	NA	11 U
Chloroform	NA	NA	12 U	NA	NA	11 U
Chloromethane	NA	NA	12 U	NA	NA	11 U
cis-1,2-Dichloroethene	NA	NA	12 U	NA	NA	11 U
cis-1,3-Dichloropropene	NA	NA	12 U	NA	NA	11 U
Cyclohexane	NA	NA	12 U	NA	NA	11 U
Dibromochloromethane	NA	NA	12 U	NA	NA	11 U
Dichlorodifluoromethane	NA	NA	12 U	NA	NA	11 U
Ethyl Benzene	NA	NA	12 U	NA	NA	11 U
Isopropylbenzene	NA	NA	12 U	NA	NA	11 U
m/p-Xylenes	NA	NA	12 U	NA	NA	11 U
Methyl Acetate	NA	NA	12 U	NA	NA	11 U
VOLATILES (ug/kg) (cont.)						
Methyl tert-butyl Ether	NA	NA	12 U	NA	NA	11 U
Methylcyclohexane	NA	NA	12 U	NA	NA	11 U
Methylene Chloride	NA	NA	12 U	NA	NA	11 U
o-Xylene	NA	NA	12 U	NA	NA	11 U
Styrene	NA	NA	12 U	NA	NA	11 U
t-1,3-Dichloropropene	NA	NA	12 U	NA	NA	11 U
Tetrachloroethene	NA	NA	1.4 J	NA	NA	11 U
Toluene	NA	NA	12 U	NA	NA	11 U
trans-1,2-Dichloroethene	NA	NA	12 U	NA	NA	11 U
Trichloroethene	NA	NA	12 U	NA	NA	11 U

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SAMPLE ID	SWMU360-SB01-03	SWMU360-SB01-05	SWMU360-SB01-09	SWMU360-SB02-02	SWMU360-SB02-05	SWMU360-SB02-09
SAMPLE DATE	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
DEPTH RANGE	5-7	9-11	17-19	3-5	9-11	17-19
Trichlorofluoromethane	NA	NA	12 U	NA	NA	11 U
Vinyl Chloride	NA	NA	12 U	NA	NA	11 U
PCB/PESTICIDES (ug/kg)						
4,4-DDD	4 U	3.8 U	4 U	3.6 U	3.7 U	3.7 U
4,4-DDE	4 U	3.8 U	4 U	3.6 U	3.7 U	3.7 U
4,4-DDT	4 U	3.8 U	4 U	3.6 U	3.7 U	3.7 U
Aldrin	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
alpha-BHC	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
alpha-Chlordane	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
beta-BHC	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
delta-BHC	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
Dieldrin	4 U	3.8 U	4 U	3.6 U	3.7 U	3.7 U
Endosulfan I	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
Endosulfan II	4 U	3.8 U	4 U	3.6 U	3.7 U	3.7 U
Endosulfan Sulfate	4 U	3.8 U	4 U	3.6 U	3.7 U	3.7 U
Endrin	4 U	3.8 U	4 U	3.6 U	3.7 U	3.7 U
Endrin aldehyde	4 U	3.8 U	4 U	3.6 U	3.7 U	3.7 U
Endrin ketone	4 U	3.8 U	4 U	3.6 U	3.7 U	3.7 U
gamma-BHC	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
gamma-Chlordane	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
Heptachlor	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
Heptachlor epoxide	2 U	1.9 U	2.1 U	1.8 U	1.9 U	1.9 U
Methoxychlor	20 U	19 U	21 U	18 U	19 U	19 U
Toxaphene	200 U	190 U	210 U	180 U	190 U	190 U
METALS (mg/kg)						
Arsenic	0.67 U	0.89 J	1 J	0.97 J	1.9 J	0.63 U
Barium	26 J	18.3 J	4.3 J	11.4 J	5.2 J	11.2 J
Cadmium	0.1 U	0.09 U	0.1 U	0.09 U	0.09 U	0.09 U
Chromium	8.6	9.7	2.5 U	7	2.9	2.7
Lead	6.6 J	6.8 J	2.8 J	4.1 J	3.1 J	2.9 J
Mercury	0.11 U	0.11 U	0.12 U	0.1 U	0.11 U	0.11 U
Selenium	0.72 U	0.69 U	0.73 U	0.64 U	0.66 U	0.68 U
Silver	0.24 UJ	0.23 UJ	0.24 UJ	0.21 UJ	0.22 UJ	0.23 UJ

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SAMPLE ID	SWMU360-SB03-01	SWMU360-SB03-04	SWMU360-SB03-10	SWMU360-SB04-02	SWMU360-SB04-06	SWMU360-SB04-10
SAMPLE DATE	06-20-2003	06-20-2003	06-20-2003	06-19-2003	06-19-2003	06-19-2003
DEPTH RANGE	1-3	7-9	19-21	3-5	11-13	19-21
VOLATILES (ug/kg)						
1,1,1-Trichloroethane	NA	NA	12 U	11 U	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	12 U	11 U	NA	NA
1,1,2-Trichloroethane	NA	NA	12 U	11 U	NA	NA
1,1,2-Trichlorotrifluoroethane	NA	NA	12 U	11 U	NA	NA
1,1-Dichloroethane	NA	NA	12 U	11 U	NA	NA
1,1-Dichloroethene	NA	NA	12 U	11 U	NA	NA
1,2,4-Trichlorobenzene	NA	NA	12 U	11 U	NA	NA
1,2-Dibromo-3-Chloropropane	NA	NA	12 U	11 U	NA	NA
1,2-Dibromoethane	NA	NA	12 U	11 U	NA	NA
1,2-Dichlorobenzene	NA	NA	12 U	11 U	NA	NA
1,2-Dichloroethane	NA	NA	12 U	11 U	NA	NA
1,2-Dichloropropane	NA	NA	12 U	11 U	NA	NA
1,3-Dichlorobenzene	NA	NA	12 U	11 U	NA	NA
1,4-Dichlorobenzene	NA	NA	12 U	11 U	NA	NA
2-Butanone	NA	NA	12 U	3.8 J	NA	NA
2-Hexanone	NA	NA	12 U	11 U	NA	NA
4-Methyl-2-Pentanone	NA	NA	12 U	11 U	NA	NA
Acetone	NA	NA	12 U	21 U	NA	NA
Benzene	NA	NA	12 U	1.5 J	NA	NA
Bromodichloromethane	NA	NA	12 U	11 U	NA	NA
Bromoform	NA	NA	12 U	11 U	NA	NA
Bromomethane	NA	NA	12 U	11 U	NA	NA
Carbon Disulfide	NA	NA	12 U	11 U	NA	NA
Carbon Tetrachloride	NA	NA	12 U	11 U	NA	NA
Chlorobenzene	NA	NA	12 U	11 U	NA	NA
Chloroethane	NA	NA	12 U	11 U	NA	NA
Chloroform	NA	NA	12 U	11 U	NA	NA
Chloromethane	NA	NA	12 U	11 U	NA	NA
cis-1,2-Dichloroethene	NA	NA	12 U	13	NA	NA
cis-1,3-Dichloropropene	NA	NA	12 U	11 U	NA	NA
Cyclohexane	NA	NA	12 U	11 U	NA	NA
Dibromochloromethane	NA	NA	12 U	11 U	NA	NA
Dichlorodifluoromethane	NA	NA	12 U	11 U	NA	NA
Ethyl Benzene	NA	NA	12 U	63	NA	NA
Isopropylbenzene	NA	NA	12 U	6.1 J	NA	NA
m/p-Xylenes	NA	NA	12 U	230	NA	NA
Methyl Acetate	NA	NA	12 U	11 U	NA	NA
VOLATILES (ug/kg) (cont.)						
Methyl tert-butyl Ether	NA	NA	12 U	11 U	NA	NA
Methylcyclohexane	NA	NA	12 U	1.3 J	NA	NA
Methylene Chloride	NA	NA	12 U	11 U	NA	NA
o-Xylene	NA	NA	12 U	100	NA	NA
Styrene	NA	NA	12 U	11 U	NA	NA
t-1,3-Dichloropropene	NA	NA	12 U	11 U	NA	NA
Tetrachloroethene	NA	NA	12 U	11 U	NA	NA
Toluene	NA	NA	12 U	9.7 J	NA	NA
trans-1,2-Dichloroethene	NA	NA	12 U	0.92 J	NA	NA
Trichloroethene	NA	NA	12 U	11 U	NA	NA

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SAMPLE ID	SWMU360-SB03-01	SWMU360-SB03-04	SWMU360-SB03-10	SWMU360-SB04-02	SWMU360-SB04-06	SWMU360-SB04-10
SAMPLE DATE	06-20-2003	06-20-2003	06-20-2003	06-19-2003	06-19-2003	06-19-2003
DEPTH RANGE	1-3	7-9	19-21	3-5	11-13	19-21
Trichlorofluoromethane	NA	NA	12 U	11 U	NA	NA
Vinyl Chloride	NA	NA	12 U	11 U	NA	NA
PCB/PESTICIDES (ug/kg)						
4,4-DDD	3.5 U	3.8 U	3.8 U	3.7 U	3.6 U	3.6 U
4,4-DDE	3.5 U	3.8 U	3.8 U	3.7 U	3.6 U	3.6 U
4,4-DDT	3.5 U	3.8 U	3.8 U	3.7 U	3.6 U	3.6 U
Aldrin	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
alpha-BHC	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
alpha-Chlordane	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
beta-BHC	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
delta-BHC	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
Dieldrin	3.5 U	3.8 U	3.8 U	3.7 U	3.6 U	3.6 U
Endosulfan I	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
Endosulfan II	3.5 U	3.8 U	3.8 U	3.7 U	3.6 U	3.6 U
Endosulfan Sulfate	3.5 U	3.8 U	3.8 U	3.7 U	3.6 U	3.6 U
Endrin	3.5 U	3.8 U	3.8 U	3.7 U	3.6 U	3.6 U
Endrin aldehyde	3.5 U	3.8 U	3.8 U	3.7 U	3.6 U	3.6 U
Endrin ketone	3.5 U	3.8 U	3.8 U	3.7 U	3.6 U	3.6 U
gamma-BHC	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
gamma-Chlordane	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
Heptachlor	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
Heptachlor epoxide	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U
Methoxychlor	18 U	19 U	20 U	19 U	18 U	18 U
Toxaphene	180 U	190 U	200 U	190 U	180 U	180 U
METALS (mg/kg)						
Arsenic	1.3 J	0.63 U	3.2	1.2 J	0.72 J	0.61 U
Barium	11.9 J	13.3 J	4.3 J	14.3 J	13.2 J	3.4 J
Cadmium	0.58 J	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U
Chromium	6.5	6.1	3.3	4.5	14.7	1 J
Lead	23.4 J	4.6 J	2.3 J	3.8 J	7.7 J	1.2 J
Mercury	0.11 U	0.1 U	0.11 U	0.11 U	0.1 U	0.11 U
Selenium	0.64 U	0.68 U	0.68 U	0.66 U	0.66 U	0.65 U
Silver	0.21 UJ	0.23 UJ	0.23 UJ	0.22 UJ	0.22 UJ	0.22 UJ

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB05-04	SWMU360-SB05-06	SWMU360-SB05-08	SWMU360-SB06-01	SWMU360-SB06-08	SWMU360-SB06-11
SAMPLE DATE	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
DEPTH RANGE	7-9	11-13	15-17	1-3	15-17	21-23
VOLATILES (ug/kg)						
1,1,1-Trichloroethane	NA	11 U	NA	NA	NA	11 U
1,1,2,2-Tetrachloroethane	NA	11 U	NA	NA	NA	11 U
1,1,2-Trichloroethane	NA	11 U	NA	NA	NA	11 U
1,1,2-Trichlorotrifluoroethane	NA	11 U	NA	NA	NA	11 U
1,1-Dichloroethane	NA	11 U	NA	NA	NA	11 U
1,1-Dichloroethene	NA	11 U	NA	NA	NA	11 U
1,2,4-Trichlorobenzene	NA	11 U	NA	NA	NA	11 U
1,2-Dibromo-3-Chloropropane	NA	11 U	NA	NA	NA	11 U
1,2-Dibromoethane	NA	11 U	NA	NA	NA	11 U
1,2-Dichlorobenzene	NA	11 U	NA	NA	NA	11 U
1,2-Dichloroethane	NA	11 U	NA	NA	NA	11 U
1,2-Dichloropropane	NA	11 U	NA	NA	NA	11 U
1,3-Dichlorobenzene	NA	11 U	NA	NA	NA	11 U
1,4-Dichlorobenzene	NA	11 U	NA	NA	NA	11 U
2-Butanone	NA	11 U	NA	NA	NA	11 U
2-Hexanone	NA	11 U	NA	NA	NA	11 U
4-Methyl-2-Pentanone	NA	11 U	NA	NA	NA	11 U
Acetone	NA	11 U	NA	NA	NA	19 U
Benzene	NA	11 U	NA	NA	NA	11 U
Bromodichloromethane	NA	11 U	NA	NA	NA	11 U
Bromoform	NA	11 U	NA	NA	NA	11 U
Bromomethane	NA	11 U	NA	NA	NA	11 U
Carbon Disulfide	NA	11 U	NA	NA	NA	11 U
Carbon Tetrachloride	NA	11 U	NA	NA	NA	11 U
Chlorobenzene	NA	11 U	NA	NA	NA	11 U
Chloroethane	NA	11 U	NA	NA	NA	11 U
Chloroform	NA	11 U	NA	NA	NA	11 U
Chloromethane	NA	11 U	NA	NA	NA	11 U
cis-1,2-Dichloroethene	NA	11 U	NA	NA	NA	11 U
cis-1,3-Dichloropropene	NA	11 U	NA	NA	NA	11 U
Cyclohexane	NA	11 U	NA	NA	NA	11 U
Dibromochloromethane	NA	11 U	NA	NA	NA	11 U
Dichlorodifluoromethane	NA	11 U	NA	NA	NA	11 U
Ethyl Benzene	NA	11 U	NA	NA	NA	11 U
Isopropylbenzene	NA	11 U	NA	NA	NA	11 U
m/p-Xylenes	NA	11 U	NA	NA	NA	11 U
Methyl Acetate	NA	11 U	NA	NA	NA	11 U
VOLATILES (ug/kg) (cont.)						
Methyl tert-butyl Ether	NA	11 U	NA	NA	NA	11 U
Methylcyclohexane	NA	11 U	NA	NA	NA	11 U
Methylene Chloride	NA	11 U	NA	NA	NA	11 U
o-Xylene	NA	11 U	NA	NA	NA	11 U
Styrene	NA	11 U	NA	NA	NA	11 U
t-1,3-Dichloropropene	NA	11 U	NA	NA	NA	11 U
Tetrachloroethene	NA	11 U	NA	NA	NA	7.9 J
Toluene	NA	11 U	NA	NA	NA	11 U
trans-1,2-Dichloroethene	NA	11 U	NA	NA	NA	11 U
Trichloroethene	NA	11 U	NA	NA	NA	11 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB05-04	SWMU360-SB05-06	SWMU360-SB05-08	SWMU360-SB06-01	SWMU360-SB06-08	SWMU360-SB06-11
SAMPLE DATE	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003	06-19-2003
DEPTH RANGE	7-9	11-13	15-17	1-3	15-17	21-23
Trichlorofluoromethane	NA	11 U	NA	NA	NA	11 U
Vinyl Chloride	NA	11 U	NA	NA	NA	11 U
PCB/PESTICIDES (ug/kg)						
4,4-DDD	3.7 U	3.5 U	3.5 U	3.6 U	3.6 U	3.8 U
4,4-DDE	3.7 U	3.5 U	3.5 U	3.6 U	3.6 U	3.8 U
4,4-DDT	3.7 U	3.5 U	3.5 U	3.6 U	3.6 U	3.8 U
Aldrin	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
alpha-BHC	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
alpha-Chlordane	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
beta-BHC	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
delta-BHC	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
Dieldrin	3.7 U	3.5 U	3.5 U	3.6 U	3.6 U	3.8 U
Endosulfan I	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
Endosulfan II	3.7 U	3.5 U	3.5 U	3.6 U	3.6 U	3.8 U
Endosulfan Sulfate	3.7 U	3.5 U	3.5 U	3.6 U	3.6 U	3.8 U
Endrin	3.7 U	3.5 U	3.5 U	3.6 U	3.6 U	3.8 U
Endrin aldehyde	3.7 U	3.5 U	3.5 U	3.6 U	3.6 U	3.8 U
Endrin ketone	3.7 U	3.5 U	3.5 U	3.6 U	3.6 U	3.8 U
gamma-BHC	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
gamma-Chlordane	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
Heptachlor	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
Heptachlor epoxide	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U	2 U
Methoxychlor	19 U	18 U	18 U	18 U	19 U	20 U
Toxaphene	190 U	180 U	180 U	180 U	190 U	200 U
METALS (mg/kg)						
Arsenic	0.64 U	0.6 U	0.59 U	0.62 U	0.62 U	7.9
Barium	7.2 J	3.5 J	2.8 J	6.4 J	4.2 J	6.2 J
Cadmium	0.09 U	0.09 U	0.08 U	0.09 U	0.09 U	0.11 J
Chromium	4.5 U	0.57 U	1.1 U	0.5 U	1.3 U	5.4
Lead	3.7 J	1.6 J	0.79 J	2.6 J	1.7 J	0.67 J
Mercury	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U
Selenium	0.68 U	0.64 U	0.63 U	0.66 U	0.67 U	0.67 U
Silver	0.23 UJ	0.21 UJ	0.21 UJ	0.22 UJ	0.22 UJ	0.22 UJ

SUBSURFACE SOIL ALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB07-04	SWMU360-SB07-08	SWMU360-SB07-12	SWMU360-SB08-01	SWMU360-SB08-02	SWMU360-SB08-10
SAMPLE DATE	06-19-2003	06-19-2003	06-19-2003	06-20-2003	06-20-2003	06-20-2003
DEPTH RANGE	7-9	15-15	23-25	1-3	3-5	19-21
VOLATILES (ug/kg)						
1,1,1-Trichloroethane	11 U	NA	NA	NA	NA	11 U
1,1,2,2-Tetrachloroethane	11 U	NA	NA	NA	NA	11 U
1,1,2-Trichloroethane	11 U	NA	NA	NA	NA	11 U
1,1,2-Trichlorotrifluoroethane	11 U	NA	NA	NA	NA	11 U
1,1-Dichloroethane	11 U	NA	NA	NA	NA	11 U
1,1-Dichloroethene	11 U	NA	NA	NA	NA	11 U
1,2,4-Trichlorobenzene	11 U	NA	NA	NA	NA	11 U
1,2-Dibromo-3-Chloropropane	11 U	NA	NA	NA	NA	11 U
1,2-Dibromoethane	11 U	NA	NA	NA	NA	11 U
1,2-Dichlorobenzene	11 U	NA	NA	NA	NA	11 U
1,2-Dichloroethane	11 U	NA	NA	NA	NA	11 U
1,2-Dichloropropane	11 U	NA	NA	NA	NA	11 U
1,3-Dichlorobenzene	11 U	NA	NA	NA	NA	11 U
1,4-Dichlorobenzene	11 U	NA	NA	NA	NA	11 U
2-Butanone	11 U	NA	NA	NA	NA	11 U
2-Hexanone	11 U	NA	NA	NA	NA	11 U
4-Methyl-2-Pentanone	11 U	NA	NA	NA	NA	11 U
Acetone	11 U	NA	NA	NA	NA	11 U
Benzene	11 U	NA	NA	NA	NA	11 U
Bromodichloromethane	11 U	NA	NA	NA	NA	11 U
Bromoform	11 U	NA	NA	NA	NA	11 U
Bromomethane	11 U	NA	NA	NA	NA	11 U
Carbon Disulfide	11 U	NA	NA	NA	NA	11 U
Carbon Tetrachloride	11 U	NA	NA	NA	NA	11 U
Chlorobenzene	11 U	NA	NA	NA	NA	11 U
Chloroethane	11 U	NA	NA	NA	NA	11 U
Chloroform	11 U	NA	NA	NA	NA	11 U
Chloromethane	11 U	NA	NA	NA	NA	11 U
cis-1,2-Dichloroethene	11 U	NA	NA	NA	NA	11 U
cis-1,3-Dichloropropene	11 U	NA	NA	NA	NA	11 U
Cyclohexane	11 U	NA	NA	NA	NA	11 U
Dibromochloromethane	11 U	NA	NA	NA	NA	11 U
Dichlorodifluoromethane	11 U	NA	NA	NA	NA	11 U
Ethyl Benzene	11 U	NA	NA	NA	NA	11 U
Isopropylbenzene	11 U	NA	NA	NA	NA	11 U
m/p-Xylenes	11 U	NA	NA	NA	NA	11 U
Methyl Acetate	11 U	NA	NA	NA	NA	11 U
VOLATILES (ug/kg) (cont.)						
Methyl tert-butyl Ether	11 U	NA	NA	NA	NA	11 U
Methylcyclohexane	11 U	NA	NA	NA	NA	11 U
Methylene Chloride	11 U	NA	NA	NA	NA	11 U
o-Xylene	11 U	NA	NA	NA	NA	11 U
Styrene	11 U	NA	NA	NA	NA	11 U
t-1,3-Dichloropropene	11 U	NA	NA	NA	NA	11 U
Tetrachloroethene	11 U	NA	NA	NA	NA	11 U
Toluene	11 U	NA	NA	NA	NA	11 U
trans-1,2-Dichloroethene	11 U	NA	NA	NA	NA	11 U
Trichloroethene	11 U	NA	NA	NA	NA	11 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB07-04	SWMU360-SB07-08	SWMU360-SB07-12	SWMU360-SB08-01	SWMU360-SB08-02	SWMU360-SB08-10
SAMPLE DATE	06-19-2003	06-19-2003	06-19-2003	06-20-2003	06-20-2003	06-20-2003
DEPTH RANGE	7-9	15-15	23-25	1-3	3-5	19-21
Trichlorofluoromethane	11 U	NA	NA	NA	NA	11 U
Vinyl Chloride	11 U	NA	NA	NA	NA	11 U
PCB/PESTICIDES (ug/kg)						
4,4-DDD	3.7 U	3.5 U	4 U	3.8 U	3.9 U	3.6 U
4,4-DDE	3.7 U	3.5 U	4 U	3.8 U	3.9 U	3.6 U
4,4-DDT	3.7 U	3.5 U	4 U	3.8 U	3.9 U	3.6 U
Aldrin	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
alpha-BHC	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
alpha-Chlordane	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
beta-BHC	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
delta-BHC	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
Dieldrin	3.7 U	3.5 U	4 U	3.8 U	3.9 U	3.6 U
Endosulfan I	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
Endosulfan II	3.7 U	3.5 U	4 U	3.8 U	3.9 U	3.6 U
Endosulfan Sulfate	3.7 U	3.5 U	4 U	3.8 U	3.9 U	3.6 U
Endrin	3.7 U	3.5 U	4 U	3.8 U	3.9 U	3.6 U
Endrin aldehyde	3.7 U	3.5 U	4 U	3.8 U	3.9 U	3.6 U
Endrin ketone	3.7 U	3.5 U	4 U	3.8 U	3.9 U	3.6 U
gamma-BHC	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
gamma-Chlordane	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
Heptachlor	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
Heptachlor epoxide	1.9 U	1.8 U	2.1 U	2 U	2 U	1.8 U
Methoxychlor	19 U	18 U	21 U	20 U	20 U	18 U
Toxaphene	190 U	180 U	210 U	200 U	200 U	180 U
METALS (mg/kg)						
Arsenic	0.62 U	0.6 U	6.3	2.2 J	1.2 J	0.73 J
Barium	11 J	4.7 J	11.9 J	16.8 J	20.6 J	8.9 J
Cadmium	0.09 U	0.09 U	0.1 U	0.09 U	0.1 U	0.09 U
Chromium	3.8 U	0.97 U	3.8 U	12.3	11.7	11.8
Lead	3.9 J	0.76 J	2.4 J	6.4 J	5.8 J	3 J
Mercury	0.1 U	0.1 U	0.12 U	0.12 U	0.12 U	0.11 U
Selenium	0.66 U	0.64 U	0.74 U	0.84 J	0.87 J	0.66 U
Silver	0.22 UJ	0.21 UJ	0.25 UJ	0.23 UJ	0.24 UJ	0.22 UJ

SUBSURFACE SOIL .ALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB09-01	SWMU360-SB09-06	SWMU360-SB10-01	SWMU360-SB10-03	SWMU360-SB10-05	SWMU360-SB11-03
SAMPLE DATE	06-20-2003	06-20-2003	06-22-2003	06-22-2003	06-22-2003	06-20-2003
DEPTH RANGE	1-3	11-13	0-1	5-7	9-11	5-7
VOLATILES (ug/kg)						
1,1,1-Trichloroethane	NA	11 U	11 U	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	11 U	11 U	NA	NA	NA
1,1,2-Trichloroethane	NA	11 U	11 U	NA	NA	NA
1,1,2-Trichlorotrifluoroethane	NA	11 U	11 U	NA	NA	NA
1,1-Dichloroethane	NA	11 U	11 U	NA	NA	NA
1,1-Dichloroethene	NA	11 U	11 U	NA	NA	NA
1,2,4-Trichlorobenzene	NA	11 U	11 U	NA	NA	NA
1,2-Dibromo-3-Chloropropane	NA	11 U	11 R	NA	NA	NA
1,2-Dibromoethane	NA	11 U	11 U	NA	NA	NA
1,2-Dichlorobenzene	NA	11 U	11 U	NA	NA	NA
1,2-Dichloroethane	NA	11 U	11 U	NA	NA	NA
1,2-Dichloropropane	NA	11 U	11 U	NA	NA	NA
1,3-Dichlorobenzene	NA	11 U	11 U	NA	NA	NA
1,4-Dichlorobenzene	NA	11 U	11 U	NA	NA	NA
2-Butanone	NA	11 U	11 U	NA	NA	NA
2-Hexanone	NA	11 U	11 U	NA	NA	NA
4-Methyl-2-Pentanone	NA	11 U	11 U	NA	NA	NA
Acetone	NA	11 U	11 UJ	NA	NA	NA
Benzene	NA	11 U	11 U	NA	NA	NA
Bromodichloromethane	NA	11 U	11 U	NA	NA	NA
Bromoform	NA	11 U	11 U	NA	NA	NA
Bromomethane	NA	11 U	11 U	NA	NA	NA
Carbon Disulfide	NA	11 U	11 U	NA	NA	NA
Carbon Tetrachloride	NA	11 U	11 U	NA	NA	NA
Chlorobenzene	NA	11 U	11 U	NA	NA	NA
Chloroethane	NA	11 U	11 U	NA	NA	NA
Chloroform	NA	11 U	11 U	NA	NA	NA
Chloromethane	NA	11 U	11 U	NA	NA	NA
cis-1,2-Dichloroethene	NA	11 U	11 U	NA	NA	NA
cis-1,3-Dichloropropene	NA	11 U	11 U	NA	NA	NA
Cyclohexane	NA	11 U	11 U	NA	NA	NA
Dibromochloromethane	NA	11 U	11 U	NA	NA	NA
Dichlorodifluoromethane	NA	11 U	11 U	NA	NA	NA
Ethyl Benzene	NA	11 U	11 U	NA	NA	NA
Isopropylbenzene	NA	11 U	11 U	NA	NA	NA
m/p-Xylenes	NA	11 U	11 U	NA	NA	NA
Methyl Acetate	NA	11 U	11 U	NA	NA	NA
VOLATILES (ug/kg) (cont.)						
Methyl tert-butyl Ether	NA	11 U	11 U	NA	NA	NA
Methylcyclohexane	NA	11 U	11 U	NA	NA	NA
Methylene Chloride	NA	11 U	11 U	NA	NA	NA
o-Xylene	NA	11 U	11 U	NA	NA	NA
Styrene	NA	11 U	11 U	NA	NA	NA
t-1,3-Dichloropropene	NA	11 U	11 U	NA	NA	NA
Tetrachloroethene	NA	11 U	11 U	NA	NA	NA
Toluene	NA	11 U	11 U	NA	NA	NA
trans-1,2-Dichloroethene	NA	11 U	11 U	NA	NA	NA
Trichloroethene	NA	11 U	11 U	NA	NA	NA

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB09-01	SWMU360-SB09-06	SWMU360-SB10-01	SWMU360-SB10-03	SWMU360-SB10-05	SWMU360-SB11-03
SAMPLE DATE	06-20-2003	06-20-2003	06-22-2003	06-22-2003	06-22-2003	06-20-2003
DEPTH RANGE	1-3	11-13	0-1	5-7	9-11	5-7
Trichlorofluoromethane	NA	11 U	11 U	NA	NA	NA
Vinyl Chloride	NA	11 U	11 U	NA	NA	NA
PCB/PESTICIDES (ug/kg)						
4,4-DDD	3.8 U	3.8 U	3.7 U	3.9 U	3.8 U	3.5 U
4,4-DDE	3.8 U	3.8 U	3.7 U	3.9 U	3.8 U	3.5 U
4,4-DDT	3.8 U	3.8 U	3.7 U	3.9 U	3.8 U	3.5 U
Aldrin	1.9 U	1.9 U	1.9 U	2 U	2 U	1.8 U
alpha-BHC	1.9 U	1.9 U	1.9 U	2 U	2 U	1.8 U
alpha-Chlordane	1.9 U	1.9 U	1.9 U	2 U	2 U	1.8 U
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
beta-BHC	1.9 U	1.9 U	1.9 U	2 U	2 U	1.8 U
delta-BHC	1.9 U	1.9 U	1.9 U	2 U	2 U	1.8 U
Dieldrin	3.8 U	3.8 U	3.7 U	3.9 U	3.8 U	3.5 U
Endosulfan I	1.9 U	1.9 U	1.9 U	2 U	2 U	1.8 U
Endosulfan II	3.8 U	3.8 U	3.7 U	3.9 U	3.8 U	3.5 U
Endosulfan Sulfate	3.8 U	3.8 U	3.7 U	3.9 U	3.8 U	3.5 U
Endrin	3.8 U	3.8 U	3.7 U	3.9 U	3.8 U	3.5 U
Endrin aldehyde	3.8 U	3.8 U	3.7 U	3.9 U	3.8 U	3.5 U
Endrin ketone	3.8 U	3.8 U	3.7 U	3.9 U	3.8 U	3.5 U
gamma-BHC	1.9 U	1.9 U	1.9 U	2 U	2 U	1.8 U
gamma-Chlordane	1.9 U	1.9 U	1.9 U	2 U	2 U	1.8 U
Heptachlor	1.9 U	1.9 U	1.9 U	2 U	2 U	1.8 U
Heptachlor epoxide	1.9 U	1.9 U	1.9 U	2 U	2 U	18 U
Methoxychlor	19 U	19 U	19 U	20 U	20 U	18 U
Toxaphene	190 U	190 U	190 U	200 U	200 U	180 U
METALS (mg/kg)						
Arsenic	0.98 J	0.64 U	0.62 U	0.72 J	0.65 U	0.6 U
Barium	11.4 J	12.4 J	8.5 J	29.4 J	14.2 J	10.9 J
Cadmium	0.09 U	0.09 U	0.09 U	0.1 U	0.09 U	0.09 U
Chromium	11.3	3.2	0.13 U	0.14 U	0.14 U	3.4
Lead	4.5 J	2.6 J	2.9	4.3	2.5	2.7 J
Mercury	0.11 U	0.11 U	0.1 U	0.11 U	0.12 U	0.11 U
Selenium	0.69 U	0.68 U	0.67 UJ	0.72 UJ	0.7 UJ	0.64 U
Silver	0.23 UJ	0.23 UJ	0.22 UJ	0.24 UJ	0.23 UJ	0.21 UJ

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB11-06	SWMU360-SB11-09	SWMU360-SB12-04	SWMU360-SB12-05	SWMU360-SB13-02	SWMU360-SB13-04
SAMPLE DATE	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003
DEPTH RANGE	11-13	17-19	7-9	9-11	3-5	7-9
VOLATILES (ug/kg)						
1,1,1-Trichloroethane	NA	11 U	11 U	NA	NA	11 U
1,1,2,2-Tetrachloroethane	NA	11 U	11 U	NA	NA	11 U
1,1,2-Trichloroethane	NA	11 U	11 U	NA	NA	11 U
1,1,2-Trichlorotrifluoroethane	NA	11 U	11 U	NA	NA	11 U
1,1-Dichloroethane	NA	11 U	11 U	NA	NA	11 U
1,1-Dichloroethene	NA	11 U	11 U	NA	NA	11 U
1,2,4-Trichlorobenzene	NA	11 U	11 U	NA	NA	11 U
1,2-Dibromo-3-Chloropropane	NA	11 U	11 U	NA	NA	11 U
1,2-Dibromoethane	NA	11 U	11 U	NA	NA	11 U
1,2-Dichlorobenzene	NA	11 U	11 U	NA	NA	11 U
1,2-Dichloroethane	NA	11 U	11 U	NA	NA	11 U
1,2-Dichloropropane	NA	11 U	11 U	NA	NA	11 U
1,3-Dichlorobenzene	NA	11 U	11 U	NA	NA	11 U
1,4-Dichlorobenzene	NA	11 U	11 U	NA	NA	11 U
2-Butanone	NA	11 U	11 U	NA	NA	11 U
2-Hexanone	NA	11 U	11 U	NA	NA	11 U
4-Methyl-2-Pentanone	NA	11 U	11 U	NA	NA	11 U
Acetone	NA	11 U	11 U	NA	NA	11 U
Benzene	NA	11 U	11 U	NA	NA	11 U
Bromodichloromethane	NA	11 U	11 U	NA	NA	11 U
Bromoform	NA	11 U	11 U	NA	NA	11 U
Bromomethane	NA	11 U	11 U	NA	NA	11 U
Carbon Disulfide	NA	11 U	11 U	NA	NA	11 U
Carbon Tetrachloride	NA	11 U	11 U	NA	NA	11 U
Chlorobenzene	NA	11 U	11 U	NA	NA	11 U
Chloroethane	NA	11 U	11 U	NA	NA	11 U
Chloroform	NA	11 U	11 U	NA	NA	11 U
Chloromethane	NA	11 U	11 U	NA	NA	11 U
cis-1,2-Dichloroethene	NA	11 U	11 U	NA	NA	11 U
cis-1,3-Dichloropropene	NA	11 U	11 U	NA	NA	11 U
Cyclohexane	NA	11 U	11 U	NA	NA	11 U
Dibromochloromethane	NA	11 U	11 U	NA	NA	11 U
Dichlorodifluoromethane	NA	11 U	11 U	NA	NA	11 U
Ethyl Benzene	NA	11 U	11 U	NA	NA	11 U
Isopropylbenzene	NA	11 U	11 U	NA	NA	11 U
m/p-Xylenes	NA	11 U	11 U	NA	NA	11 U
Methyl Acetate	NA	11 U	11 U	NA	NA	11 U
VOLATILES (ug/kg) (cont.)						
Methyl tert-butyl Ether	NA	11 U	11 U	NA	NA	11 U
Methylcyclohexane	NA	11 U	11 U	NA	NA	11 U
Methylene Chloride	NA	11 U	11 U	NA	NA	11 U
o-Xylene	NA	11 U	11 U	NA	NA	11 U
Styrene	NA	11 U	11 U	NA	NA	11 U
t-1,3-Dichloropropene	NA	11 U	11 U	NA	NA	11 U
Tetrachloroethene	NA	11 U	11 U	NA	NA	11 U
Toluene	NA	11 U	11 U	NA	NA	11 U
trans-1,2-Dichloroethene	NA	11 U	11 U	NA	NA	11 U
Trichloroethene	NA	11 U	11 U	NA	NA	11 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB11-06	SWMU360-SB11-09	SWMU360-SB12-04	SWMU360-SB12-05	SWMU360-SB13-02	SWMU360-SB13-04
SAMPLE DATE	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003
DEPTH RANGE	11-13	17-19	7-9	9-11	3-5	7-9
Trichlorofluoromethane	NA	11 U	11 U	NA	NA	11 U
Vinyl Chloride	NA	11 U	11 U	NA	NA	11 U
PCB/PESTICIDES (ug/kg)						
4,4-DDD	3.9 U	3.5 U	3.5 U	3.8 U	4 U	3.7 U
4,4-DDE	3.9 U	3.5 U	3.5 U	3.8 U	4 U	3.7 U
4,4-DDT	3.9 U	3.5 U	3.5 U	3.8 U	4 U	3.7 U
Aldrin	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
alpha-BHC	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
alpha-Chlordane	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
beta-BHC	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
delta-BHC	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
Dieldrin	3.9 U	3.5 U	3.5 U	3.8 U	4 U	3.7 U
Endosulfan I	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
Endosulfan II	3.9 U	3.5 U	3.5 U	3.8 U	4 U	3.7 U
Endosulfan Sulfate	3.9 U	3.5 U	3.5 U	3.8 U	4 U	3.7 U
Endrin	3.9 U	3.5 U	3.5 U	3.8 U	4 U	3.7 U
Endrin aldehyde	3.9 U	3.5 U	3.5 U	3.8 U	4 U	3.7 U
Endrin ketone	3.9 U	3.5 U	3.5 U	3.8 U	4 U	3.7 U
gamma-BHC	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
gamma-Chlordane	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
Heptachlor	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
Heptachlor epoxide	2 U	1.8 U	1.8 U	1.9 U	2.1 U	1.9 U
Methoxychlor	20 U	18 U	18 U	19 U	21 U	19 U
Toxaphene	200 U	180 U	180 U	190 U	210 U	190 U
METALS (mg/kg)						
Arsenic	0.65 J	4.5	0.58 U	0.64 U	0.68 U	0.63 U
Barium	2.6 J	15.2 J	2.8 J	3 J	8.4 J	11.7 J
Cadmium	0.09 U	0.08 U	0.08 U	0.09 U	0.1 U	0.09 U
Chromium	1.9 J	9.7	1.4 J	1 J	0.15 U	2.2 J
Lead	1.5	0.87	0.96	0.69	3.7	2.6
Mercury	0.12 U	0.11 U	0.1 U	0.1 U	0.12 U	0.11 U
Selenium	0.7 UJ	0.63 UJ	0.63 UJ	0.69 UJ	0.73 UJ	0.67 UJ
Silver	0.23 UJ	0.21 UJ	0.21 UJ	0.23 UJ	0.24 UJ	0.22 UJ

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB13-05	SWMU360-SB14-02	SWMU360-SB14-04	SWMU360-SB14-10	SWMU360-SB15-02	SWMU360-SB15-04
SAMPLE DATE	06-20-2003	06-20-2003	06-20-2003	06-22-2003	06-20-2003	06-20-2003
DEPTH RANGE	9-11	3-5	7-9	19-21	3-5	7-9
VOLATILES (ug/kg)						
1,1,1-Trichloroethane	NA	NA	11 U	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	11 U	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	11 U	NA	NA	NA
1,1,2-Trichlorotrifluoroethane	NA	NA	11 U	NA	NA	NA
1,1-Dichloroethane	NA	NA	11 U	NA	NA	NA
1,1-Dichloroethene	NA	NA	11 U	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	11 U	NA	NA	NA
1,2-Dibromo-3-Chloropropane	NA	NA	11 U	NA	NA	NA
1,2-Dibromoethane	NA	NA	11 U	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	11 U	NA	NA	NA
1,2-Dichloroethane	NA	NA	11 U	NA	NA	NA
1,2-Dichloropropane	NA	NA	11 U	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	11 U	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	11 U	NA	NA	NA
2-Butanone	NA	NA	11 U	NA	NA	NA
2-Hexanone	NA	NA	11 U	NA	NA	NA
4-Methyl-2-Pentanone	NA	NA	11 U	NA	NA	NA
Acetone	NA	NA	11 U	NA	NA	NA
Benzene	NA	NA	11 U	NA	NA	NA
Bromodichloromethane	NA	NA	11 U	NA	NA	NA
Bromoform	NA	NA	11 U	NA	NA	NA
Bromomethane	NA	NA	11 U	NA	NA	NA
Carbon Disulfide	NA	NA	11 U	NA	NA	NA
Carbon Tetrachloride	NA	NA	11 U	NA	NA	NA
Chlorobenzene	NA	NA	11 U	NA	NA	NA
Chloroethane	NA	NA	11 U	NA	NA	NA
Chloroform	NA	NA	11 U	NA	NA	NA
Chloromethane	NA	NA	11 U	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	11 U	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	11 U	NA	NA	NA
Cyclohexane	NA	NA	11 U	NA	NA	NA
Dibromochloromethane	NA	NA	11 U	NA	NA	NA
Dichlorodifluoromethane	NA	NA	11 U	NA	NA	NA
Ethyl Benzene	NA	NA	11 U	NA	NA	NA
Isopropylbenzene	NA	NA	11 U	NA	NA	NA
m/p-Xylenes	NA	NA	11 U	NA	NA	NA
Methyl Acetate	NA	NA	11 U	NA	NA	NA
VOLATILES (ug/kg) (cont.)						
Methyl tert-butyl Ether	NA	NA	11 U	NA	NA	NA
Methylcyclohexane	NA	NA	11 U	NA	NA	NA
Methylene Chloride	NA	NA	11 U	NA	NA	NA
o-Xylene	NA	NA	11 U	NA	NA	NA
Styrene	NA	NA	11 U	NA	NA	NA
t-1,3-Dichloropropene	NA	NA	11 U	NA	NA	NA
Tetrachloroethene	NA	NA	11 U	NA	NA	NA
Toluene	NA	NA	11 U	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	11 U	NA	NA	NA
Trichloroethene	NA	NA	11 U	NA	NA	NA

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB13-05	SWMU360-SB14-02	SWMU360-SB14-04	SWMU360-SB14-10	SWMU360-SB15-02	SWMU360-SB15-04
SAMPLE DATE	06-20-2003	06-20-2003	06-20-2003	06-22-2003	06-20-2003	06-20-2003
DEPTH RANGE	9-11	3-5	7-9	19-21	3-5	7-9
Trichlorofluoromethane	NA	NA	11 U	NA	NA	NA
Vinyl Chloride	NA	NA	11 U	NA	NA	NA
PCB/PESTICIDES (ug/kg)						
4,4-DDD	3.8 U	3.8 UJ	3.6 U	3.5 U	3.8 U	3.6 U
4,4-DDE	3.8 U	3.8 UJ	3.6 U	3.5 U	3.8 U	3.6 U
4,4-DDT	3.8 U	3.8 UJ	3.6 U	3.5 U	3.8 U	3.6 U
Aldrin	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
alpha-BHC	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
alpha-Chlordane	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
Aroclor-1254	NA	NA	NA	1.8 U	NA	NA
Aroclor-1260	NA	NA	NA	1.8 U	NA	NA
beta-BHC	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
delta-BHC	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
Dieldrin	3.8 U	3.8 UJ	3.6 U	3.5 U	3.8 U	3.6 U
Endosulfan I	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
Endosulfan II	3.8 U	3.8 UJ	3.6 U	3.5 U	3.8 U	3.6 U
Endosulfan Sulfate	3.8 U	3.8 UJ	3.6 U	3.5 U	3.8 U	3.6 U
Endrin	3.8 U	3.8 UJ	3.6 U	3.5 U	3.8 U	3.6 U
Endrin aldehyde	3.8 U	3.8 UJ	3.6 U	3.5 U	3.8 U	3.6 U
Endrin ketone	3.8 U	3.8 UJ	3.6 U	3.5 U	3.8 U	3.6 U
gamma-BHC	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
gamma-Chlordane	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
Heptachlor	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
Heptachlor epoxide	2 U	2 UJ	1.9 U	1.8 U	2 U	1.9 U
Methoxychlor	20 U	20 UJ	19 U	18 U	20 U	19 U
Toxaphene	200 U	200 UJ	190 U	180 U	200 U	190 U
METALS (mg/kg)						
Arsenic	0.64 U	1.9 J	0.6 U	0.58 U	1.6 J	0.95 J
Barium	12.6 J	17 J	10 J	5.4 J	15.7 J	11.1 J
Cadmium	0.09 U	0.09 U	0.09 U	0.08 U	0.09 U	0.09 U
Chromium	0.14 U	10.7	2.2	0.12 U	10.2	5
Lead	1	6.1	1.7 J	1.2	4.7 J	3.5 J
Mercury	0.11 U	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U
Selenium	0.69 UJ	0.71 UJ	0.64 U	0.62 UJ	0.71 U	0.67 U
Silver	0.23 UJ	0.24 UJ	0.21 UJ	0.21 UJ	0.24 UJ	0.22 UJ

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB15-05	SWMU360-SB16-02	SWMU360-SB16-03	SWMU360-SB16-09
SAMPLE DATE	06-20-2003	06-24-2003	06-24-2003	06-24-2003
DEPTH RANGE	9-11	3-5	5-7	17-19
VOLATILES (ug/kg)				
1,1,1-Trichloroethane	11 U	NA	NA	11 U
1,1,2,2-Tetrachloroethane	11 U	NA	NA	11 U
1,1,2-Trichloroethane	11 U	NA	NA	11 U
1,1,2-Trichlorotrifluoroethane	11 U	NA	NA	11 U
1,1-Dichloroethane	11 U	NA	NA	11 U
1,1-Dichloroethene	11 U	NA	NA	11 U
1,2,4-Trichlorobenzene	11 U	NA	NA	11 U
1,2-Dibromo-3-Chloropropane	11 U	NA	NA	11 U
1,2-Dibromoethane	11 U	NA	NA	11 U
1,2-Dichlorobenzene	11 U	NA	NA	11 U
1,2-Dichloroethane	11 U	NA	NA	11 U
1,2-Dichloropropane	11 U	NA	NA	11 U
1,3-Dichlorobenzene	11 U	NA	NA	11 U
1,4-Dichlorobenzene	11 U	NA	NA	11 U
2-Butanone	11 U	NA	NA	11 U
2-Hexanone	11 U	NA	NA	11 U
4-Methyl-2-Pentanone	11 U	NA	NA	11 U
Acetone	11 U	NA	NA	26
Benzene	11 U	NA	NA	11 U
Bromodichloromethane	11 U	NA	NA	11 U
Bromoform	11 U	NA	NA	11 U
Bromomethane	11 U	NA	NA	11 U
Carbon Disulfide	11 U	NA	NA	2 J
Carbon Tetrachloride	11 U	NA	NA	11 U
Chlorobenzene	11 U	NA	NA	11 U
Chloroethane	11 U	NA	NA	11 U
Chloroform	11 U	NA	NA	11 U
Chloromethane	11 U	NA	NA	11 U
cis-1,2-Dichloroethene	11 U	NA	NA	11 U
cis-1,3-Dichloropropene	11 U	NA	NA	11 U
Cyclohexane	11 U	NA	NA	11 U
Dibromochloromethane	11 U	NA	NA	11 U
Dichlorodifluoromethane	11 U	NA	NA	11 U
Ethyl Benzene	11 U	NA	NA	11 U
Isopropylbenzene	11 U	NA	NA	11 U
m/p-Xylenes	11 U	NA	NA	11 U
Methyl Acetate	11 U	NA	NA	11 U
VOLATILES (ug/kg) (cont.)				
Methyl tert-butyl Ether	11 U	NA	NA	11 U
Methylcyclohexane	11 U	NA	NA	11 U
Methylene Chloride	11 U	NA	NA	11 U
o-Xylene	11 U	NA	NA	11 U
Styrene	11 U	NA	NA	11 U
t-1,3-Dichloropropene	11 U	NA	NA	11 U
Tetrachloroethene	11 U	NA	NA	11 U
Toluene	11 U	NA	NA	11 U
trans-1,2-Dichloroethene	11 U	NA	NA	11 U
Trichloroethene	11 U	NA	NA	11 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB15-05	SWMU360-SB16-02	SWMU360-SB16-03	SWMU360-SB16-09
SAMPLE DATE	06-20-2003	06-24-2003	06-24-2003	06-24-2003
DEPTH RANGE	9-11	3-5	5-7	17-19
Trichlorofluoromethane	11 U	NA	NA	11 U
Vinyl Chloride	11 U	NA	NA	11 U
PCB/PESTICIDES (ug/kg)				
4,4-DDD	3.7 U	3.7 U	3.7 U	3.6 U
4,4-DDE	3.7 U	3.7 U	3.7 U	3.6 U
4,4-DDT	3.7 U	3.7 U	3.7 U	3.6 U
Aldrin	1.9 U	1.9 U	1.9 U	1.9 U
alpha-BHC	1.9 U	1.9 U	1.9 U	1.9 U
alpha-Chlordane	1.9 U	1.9 U	1.9 U	1.9 U
Aroclor-1254	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA
beta-BHC	1.9 U	1.9 U	1.9 U	1.9 U
delta-BHC	1.9 U	1.9 U	1.9 U	1.9 U
Dieldrin	3.7 U	3.7 U	3.7 U	3.6 U
Endosulfan I	1.9 U	1.9 U	1.9 U	1.9 U
Endosulfan II	3.7 U	3.7 U	3.7 U	3.6 U
Endosulfan Sulfate	3.7 U	3.7 U	3.7 U	3.6 U
Endrin	3.7 U	3.7 U	3.7 U	3.6 U
Endrin aldehyde	3.7 U	3.7 U	3.7 U	3.6 U
Endrin ketone	3.7 U	3.7 U	3.7 U	3.6 U
gamma-BHC	1.9 U	1.9 U	1.9 U	1.9 U
gamma-Chlordane	1.9 U	1.9 U	1.9 U	1.9 U
Heptachlor	1.9 U	1.9 U	1.9 U	1.9 U
Heptachlor epoxide	1.9 U	1.9 U	1.9 U	1.9 U
Methoxychlor	19 U	19 U	19 U	19 U
Toxaphene	190 U	190 U	190 U	190 U
METALS (mg/kg)				
Arsenic	0.64 U	0.62 U	0.62 U	0.62 U
Barium	12 J	7.6 J	7.3 J	9.9 J
Cadmium	0.11 J	0.09 U	0.09 U	0.09 U
Chromium	7.2	0.13 U	0.13 U	0.13 U
Lead	14.5 J	5.9 J	1.9 J	5.4 J
Mercury	0.11 U	0.11 U	0.11 U	0.11 U
Selenium	0.68 U	0.67 U	0.66 U	0.66 U
Silver	0.23 UJ	0.22 UJ	0.22 UJ	0.24 UJ

SUBSURFACE SOIL DUPLICATE ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB04-02D	SWMU360-SB07-04D	SWMU360-SB12-04D	SWMU360-SB13-04D
SAMPLE DATE	06-19-2003	06-19-2003	06-20-2003	06-20-2003
DEPTH RANGE	3-5	7-9	7-9	7-9
VOLATILES (ug/kg)				
1,1,1-Trichloroethane	NA	11 U	NA	11 U
1,1,2,2-Tetrachloroethane	NA	11 U	NA	11 U
1,1,2-Trichloroethane	NA	11 U	NA	11 U
1,1,2-Trichlorotrifluoroethane	NA	11 U	NA	11 U
1,1-Dichloroethane	NA	11 U	NA	11 U
1,1-Dichloroethene	NA	11 U	NA	11 U
1,2,4-Trichlorobenzene	NA	11 U	NA	11 U
1,2-Dibromo-3-Chloropropane	NA	11 U	NA	11 U
1,2-Dibromoethane	NA	11 U	NA	11 U
1,2-Dichlorobenzene	NA	11 U	NA	11 U
1,2-Dichloroethane	NA	11 U	NA	11 U
1,2-Dichloropropane	NA	11 U	NA	11 U
1,3-Dichlorobenzene	NA	11 U	NA	11 U
1,4-Dichlorobenzene	NA	11 U	NA	11 U
2-Butanone	NA	11 U	NA	11 U
2-Hexanone	NA	11 U	NA	11 U
4-Methyl-2-Pentanone	NA	11 U	NA	11 U
Acetone	NA	11 U	NA	11 U
Benzene	NA	11 U	NA	11 U
Bromodichloromethane	NA	11 U	NA	11 U
Bromoform	NA	11 U	NA	11 U
Bromomethane	NA	11 U	NA	11 U
Carbon Disulfide	NA	11 U	NA	11 U
Carbon Tetrachloride	NA	11 U	NA	11 U
Chlorobenzene	NA	11 U	NA	11 U
Chloroethane	NA	11 U	NA	11 U
Chloroform	NA	11 U	NA	11 U
Chloromethane	NA	11 U	NA	11 U
cis-1,2-Dichloroethene	NA	11 U	NA	11 U
cis-1,3-Dichloropropene	NA	11 U	NA	11 U
Cyclohexane	NA	11 U	NA	11 U
Dibromochloromethane	NA	11 U	NA	11 U
Dichlorodifluoromethane	NA	11 U	NA	11 U
Ethyl Benzene	NA	11 U	NA	11 U
Isopropylbenzene	NA	11 U	NA	11 U
m/p-Xylenes	NA	11 U	NA	11 U
Methyl Acetate	NA	11 U	NA	11 U
VOLATILES (ug/kg)				
Methyl tert-butyl Ether	NA	11 U	NA	11 U
Methylcyclohexane	NA	11 U	NA	11 U
Methylene Chloride	NA	11 U	NA	11 U
o-Xylene	NA	11 U	NA	11 U
Styrene	NA	11 U	NA	11 U
t-1,3-Dichloropropene	NA	11 U	NA	11 U
Tetrachloroethene	NA	1.6 J	NA	11 U
Toluene	NA	11 U	NA	11 U
trans-1,2-Dichloroethene	NA	11 U	NA	11 U

SUBSURFACE SOIL DUPLICATE ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU360-SB04-02D	SWMU360-SB07-04D	SWMU360-SB12-04D	SWMU360-SB13-04D
SAMPLE DATE	06-19-2003	06-19-2003	06-20-2003	06-20-2003
DEPTH RANGE	3-5	7-9	7-9	7-9
Trichloroethene	NA	11 U	NA	11 U
Trichlorofluoromethane	NA	11 U	NA	11 U
Vinyl Chloride	NA	11 U	NA	11 U
PESTICIDES (ug/kg)				
4,4-DDD	3.7 U	3.8 U	3.6 U	NA
4,4-DDE	3.7 U	3.8 U	3.6 U	NA
4,4-DDT	3.7 U	3.8 U	3.6 U	NA
Aldrin	1.9 U	1.9 U	1.8 U	NA
alpha-BHC	1.9 U	1.9 U	1.8 U	NA
alpha-Chlordane	1.9 U	1.9 U	1.8 U	NA
Aroclor-1254	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA
beta-BHC	1.9 U	1.9 U	1.8 U	NA
delta-BHC	1.9 U	1.9 U	1.8 U	NA
Dieldrin	3.7 U	3.8 U	3.6 U	NA
Endosulfan I	1.9 U	1.9 U	1.8 U	NA
Endosulfan II	3.7 U	3.8 U	3.6 U	NA
Endosulfan Sulfate	3.7 U	3.8 U	3.6 U	NA
Endrin	3.7 U	3.8 U	3.6 U	NA
Endrin aldehyde	3.7 U	3.8 U	3.6 U	NA
Endrin ketone	3.7 U	3.8 U	3.6 U	NA
gamma-BHC	1.9 U	1.9 U	1.8 U	NA
gamma-Chlordane	1.9 U	1.9 U	1.8 U	NA
Heptachlor	1.9 U	1.9 U	1.8 U	NA
Heptachlor epoxide	1.9 U	1.9 U	1.8 U	NA
Methoxychlor	19 U	19 U	18 U	NA
Toxaphene	190 U	190 U	180 U	NA
METALS (mg/kg)				
Arsenic	0.87 J	0.63 U	0.62 U	NA
Barium	14.7 J	11.3 J	5.1 J	NA
Cadmium	0.09 U	0.09 U	0.09 U	NA
Chromium	5.4	5	2.3	NA
Lead	3.8 J	4.5 J	1.4	NA
Mercury	0.11 U	0.11 U	0.1 U	NA
Selenium	0.67 U	0.68 U	0.66 UJ	NA
Silver	0.22 UJ	0.23 UJ	0.22 UJ	NA

GROUNDWATER ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-GW01	SWMU360-GW02	SWMU360-GW02-02	SWMU360-GW02-03	SWMU360-GW03	SWMU360-GW04	SWMU360-GW05
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-19-2003	06-19-2003	06-24-2003	06-24-2003	06-19-2003	06-19-2003	06-19-2003
Volatiles (ug/l)							
1,1,1,2-Tetrachloroethane							
1,1,1-Trichloroethane							
1,1,2,2-Tetrachloroethane							
1,1,2-Trichloroethane							
1,1-Dichloroethane							
1,1-Dichloroethene	1 U	1	1	2	7	1 U	1 U
1,1-Dichloropropene							
1,2,3-Trichlorobenzene							
1,2,3-Trichloropropane							
1,2,4-Trichlorobenzene							
1,2,4-Trimethylbenzene							
1,2-Dibromo-3-chloropropane							
1,2-Dibromoethane							
1,2-Dichlorobenzene							
1,2-Dichloroethane							
1,2-Dichloropropane							
1,3,5-Trimethylbenzene							
1,3-Dichlorobenzene							
1,3-Dichloropropane							
1,4-Dichlorobenzene							
2,2-Dichloropropane							
2-Chlorotoluene							
4-Chlorotoluene							
Benzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromobenzene							
Bromochloromethane							
Bromodichloroemethane							
Bromoform							
Bromomethane							
Carbon Tetrachloride							
Chlorobenzene							
Chloroethane							
Chloroform							
Chloromethane							
cis-1,2-Dichloroethene	1 U	46	50	59	316	18	80
cis-1,3-Dichloropropene							
Dibromochloromethane							
Dibromomethane							
Dichlorodifluoromethane							
Ethylbenzene							
Hexachlorobutadiene							

GROUNDWATER ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-GW01	SWMU360-GW02	SWMU360-GW02-02	SWMU360-GW02-03	SWMU360-GW03	SWMU360-GW04	SWMU360-GW05
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-19-2003	06-19-2003	06-24-2003	06-24-2003	06-19-2003	06-19-2003	06-19-2003
Isopropylbenzene							
meta,para-Xylene							
Methylene Chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene							
n-Butylbenzene							
n-Propylbenzene							
ortho-Xylene							
para-Isopropyltoluene							
sec-Butylbenzene							
Styrene							
tert-Butylbenzene							
Tetrachloroethene	0.6	0.5 U	0.5 U	0.5 U	0.5 U	6	211.7
Toluene							
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	4	1 U	1 U
trans-1,3-Dichloropropene							
Trichloroethene	1 U	7	8	10	55	1	30
Trichlorofluoromethane							
Vinyl Chloride							

GROUNDWATER ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
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Site Sample I.D.	SWMU360-GW05-02	SWMU360-GW05-03	SWMU360-GW06	SWMU360-GW07	SWMU360-GW08	SWMU360-GW09	SWMU360-GW10
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-24-2003	06-24-2003	06-19-2003	06-19-2003	06-20-2003	06-20-2003	06-22-2003
Volatiles (ug/l)							
1,1,1,2-Tetrachloroethane							
1,1,1-Trichloroethane							
1,1,2,2-Tetrachloroethane							
1,1,2-Trichloroethane							
1,1-Dichloroethane							
1,1-Dichloroethene	1	1 U	1 U	1 U	2	1 U	1 U
1,1-Dichloropropene							
1,2,3-Trichlorobenzene							
1,2,3-Trichloropropane							
1,2,4-Trichlorobenzene							
1,2,4-Trimethylbenzene							
1,2-Dibromo-3-chloropropane							
1,2-Dibromoethane							
1,2-Dichlorobenzene							
1,2-Dichloroethane							
1,2-Dichloropropane							
1,3,5-Trimethylbenzene							
1,3-Dichlorobenzene							
1,3-Dichloropropane							
1,4-Dichlorobenzene							
2,2-Dichloropropane							
2-Chlorotoluene							
4-Chlorotoluene							
Benzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromobenzene							
Bromochloromethane							
Bromodichloroemethane							
Bromoform							
Bromomethane							
Carbon Tetrachloride							
Chlorobenzene							
Chloroethane							
Chloroform							
Chloromethane							
cis-1,2-Dichloroethene	42	5	32	17	44	23	26
cis-1,3-Dichloropropene							
Dibromochloromethane							
Dibromomethane							
Dichlorodifluoromethane							
Ethylbenzene							
Hexachlorobutadiene							

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SWMU 360
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Site Sample I.D.	SWMU360-GW05-02	SWMU360-GW05-03	SWMU360-GW06	SWMU360-GW07	SWMU360-GW08	SWMU360-GW09	SWMU360-GW10
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-24-2003	06-24-2003	06-19-2003	06-19-2003	06-20-2003	06-20-2003	06-22-2003
Isopropylbenzene							
meta,para-Xylene							
Methylene Chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene							
n-Butylbenzene							
n-Propylbenzene							
ortho-Xylene							
para-Isopropyltoluene							
sec-Butylbenzene							
Styrene							
tert-Butylbenzene							
Tetrachloroethene	7.5	1.1	2.4	0.8	0.5 U	0.5 U	0.6
Toluene							
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene							
Trichloroethene	7	1 U	5	2	6	4	3
Trichlorofluoromethane							
Vinyl Chloride							

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Site Sample I.D.	SWMU360-GW11	SWMU360-GW11-02	SWMU360-GW11-03	SWMU360-GW12	SWMU360-GW13	SWMU360-GW13-02	SWMU360-GW13-03
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003
Volatiles (ug/l)							
1,1,1,2-Tetrachloroethane							
1,1,1-Trichloroethane							
1,1,2,2-Tetrachloroethane							
1,1,2-Trichloroethane							
1,1-Dichloroethane							
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene							
1,2,3-Trichlorobenzene							
1,2,3-Trichloropropane							
1,2,4-Trichlorobenzene							
1,2,4-Trimethylbenzene							
1,2-Dibromo-3-chloropropane							
1,2-Dibromoethane							
1,2-Dichlorobenzene							
1,2-Dichloroethane							
1,2-Dichloropropane							
1,3,5-Trimethylbenzene							
1,3-Dichlorobenzene							
1,3-Dichloropropane							
1,4-Dichlorobenzene							
2,2-Dichloropropane							
2-Chlorotoluene							
4-Chlorotoluene							
Benzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromobenzene							
Bromochloromethane							
Bromodichloroemethane							
Bromoform							
Bromomethane							
Carbon Tetrachloride							
Chlorobenzene							
Chloroethane							
Chloroform							
Chloromethane							
cis-1,2-Dichloroethene	4	3	1	1	1 U	3	4
cis-1,3-Dichloropropene							
Dibromochloromethane							
Dibromomethane							
Dichlorodifluoromethane							
Ethylbenzene							
Hexachlorobutadiene							

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SWMU 360
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Site Sample I.D.	SWMU360-GW11	SWMU360-GW11-02	SWMU360-GW11-03	SWMU360-GW12	SWMU360-GW13	SWMU360-GW13-02	SWMU360-GW13-03
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003	06-20-2003
Isopropylbenzene							
meta,para-Xylene							
Methylene Chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene							
n-Butylbenzene							
n-Propylbenzene							
ortho-Xylene							
para-Isopropyltoluene							
sec-Butylbenzene							
Styrene							
tert-Butylbenzene							
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	5.5	0.5	0.5 U
Toluene							
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene							
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane							
Vinyl Chloride							

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SWMU 360
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Site Sample I.D.	SWMU360-GW14	SWMU360-GW15	SWMU360-GW16	SWMU360-GW16-02	SWMU360-GW16-03	SWMU360-GW17-02	SWMU360-GW17-03
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-20-2003	06-20-2003	06-24-2003	06-24-2003	06-24-2003	06-24-2003	06-24-2003
Volatiles (ug/l)							
1,1,1,2-Tetrachloroethane							
1,1,1-Trichloroethane							
1,1,2,2-Tetrachloroethane							
1,1,2-Trichloroethane							
1,1-Dichloroethane							
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1	1	1 U
1,1-Dichloropropene							
1,2,3-Trichlorobenzene							
1,2,3-Trichloropropane							
1,2,4-Trichlorobenzene							
1,2,4-Trimethylbenzene							
1,2-Dibromo-3-chloropropane							
1,2-Dibromoethane							
1,2-Dichlorobenzene							
1,2-Dichloroethane							
1,2-Dichloropropane							
1,3,5-Trimethylbenzene							
1,3-Dichlorobenzene							
1,3-Dichloropropane							
1,4-Dichlorobenzene							
2,2-Dichloropropane							
2-Chlorotoluene							
4-Chlorotoluene							
Benzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromobenzene							
Bromochloromethane							
Bromodichloroemethane							
Bromoform							
Bromomethane							
Carbon Tetrachloride							
Chlorobenzene							
Chloroethane							
Chloroform							
Chloromethane							
cis-1,2-Dichloroethene	15	1 U	40	20	54	43	4
cis-1,3-Dichloropropene							
Dibromochloromethane							
Dibromomethane							
Dichlorodifluoromethane							
Ethylbenzene							
Hexachlorobutadiene							

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SWMU 360
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MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-GW14	SWMU360-GW15	SWMU360-GW16	SWMU360-GW16-02	SWMU360-GW16-03	SWMU360-GW17-02	SWMU360-GW17-03
Lab Sample I.D.	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Sample Date	06-20-2003	06-20-2003	06-24-2003	06-24-2003	06-24-2003	06-24-2003	06-24-2003
Isopropylbenzene							
meta,para-Xylene							
Methylene Chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene							
n-Butylbenzene							
n-Propylbenzene							
ortho-Xylene							
para-Isopropyltoluene							
sec-Butylbenzene							
Styrene							
tert-Butylbenzene							
Tetrachloroethene	3.5	2.5	0.5 U	0.5 U	0.5 U	4.5	5.2
Toluene							
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene							
Trichloroethene	2	1	7	4	9	7	1
Trichlorofluoromethane							
Vinyl Chloride							

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SWMU 360
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MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-gw18	SWMU360-gw19	SWMU360-gw20	SWMU360-gw21	SWMU360-gw21-1	SWMU360-gw21-2	SWMU360-gw22	SWMU360-gw22-2
Lab Sample I.D.	03-0299	03-0300	03-0283	03-0277	03-0278	03-0279	03-0284	03-0285
Sample Date	Missing	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Volatiles (ug/l)								
1,1,1,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,1-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethene	2 U	1 J	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,3-Trichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,3-Trichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,4-Trichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,4-Trimethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromoethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3,5-Trimethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,4-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2,2-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Chlorotoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromochloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromodichloroemethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromoform	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromomethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon Tetrachloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroform	2 U	2 U	2 U	2	2 U	2 U	4	1 J
Chloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 J	28	23	2 U	26	29	11	27
cis-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromochloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromomethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichlorodifluoromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Hexachlorobutadiene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

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Site Sample I.D.	SWMU360-gw18	SWMU360-gw19	SWMU360-gw20	SWMU360-gw21	SWMU360-gw21-1	SWMU360-gw21-2	SWMU360-gw22	SWMU360-gw22-2
Lab Sample I.D.	03-0299	03-0300	03-0283	03-0277	03-0278	03-0279	03-0284	03-0285
Sample Date	Missing	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Isopropylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
meta,para-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
ortho-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
para-Isopropyltoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
sec-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Styrene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
tert-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	2 U	2 U	4	2 U	1 J	2 U	2 U
Toluene	2 U	2	2 U	3	2	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Trichloroethene	2 U	6	6	1 J	7	8	2	6
Trichlorofluoromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl Chloride	2 U	2 U	2 U	2 U	1 J	2 J	2 U	2 U

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Site Sample I.D.	SWMU360-gw22-3	SWMU360-gw23	SWMU360-gw23-2	SWMU360-gw23-3	SWMU360-gw24	SWMU360-gw24-2	SWMU360-gw25	SWMU360-gw26
Lab Sample I.D.	03-0286	03-0280	03-0281	03-0282	03-0287	03-0289	03-0288	03-0301
Sample Date	Missing	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Volatiles (ug/l)								
1,1,1,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,1-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,3-Trichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,3-Trichloropropane	2 U	2 U	2 U	2 U	2 U	2	2 U	2 U
1,2,4-Trichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,4-Trimethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromoethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3,5-Trimethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,4-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2,2-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Chlorotoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromochloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromodichloroemethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromoform	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromomethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon Tetrachloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroform	2 U	6	2	1 J	2 U	2 U	2 U	2 U
Chloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	27	2 U	14	2 U	2 U	2 U	47	2 U
cis-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromochloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromomethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichlorodifluoromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Hexachlorobutadiene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

GROUNDWATER ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-gw22-3	SWMU360-gw23	SWMU360-gw23-2	SWMU360-gw23-3	SWMU360-gw24	SWMU360-gw24-2	SWMU360-gw25	SWMU360-gw26
Lab Sample I.D.	03-0286	03-0280	03-0281	03-0282	03-0287	03-0289	03-0288	03-0301
Sample Date	Missing	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Isopropylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
meta,para-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
ortho-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
para-Isopropyltoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
sec-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Styrene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
tert-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	2 U	1 J	2 U	2 U	2 U	17	2 U
Toluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Trichloroethene	6	2 U	4	2 U	2 U	2 U	13	2 U
Trichlorofluoromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl Chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

GROUNDWATER ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-gw27	SWMU360-gw28	SWMU360-gw28-1	SWMU360-gw28-2	SWMU360-gw29	SWMU360-gw29-2	SWMU360-gw29-3	SWMU360-gw30
Lab Sample I.D.	03-0302	03-0303	03-0304	03-0305	03-0322	03-0323	03-0324	03-0306
Sample Date	Missing	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Volatiles (ug/l)								
1,1,1,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,1-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	1 J	2 U	2 U
1,1-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,3-Trichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,3-Trichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,4-Trichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,4-Trimethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromoethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3,5-Trimethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,4-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2,2-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Chlorotoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromochloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromodichloroemethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromoform	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromomethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon Tetrachloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroform	2 U	1 J	2 U	2 U	2 U	2 U	2 U	2 U
Chloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	2 U	2 U	30	32	31	2 U
cis-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromochloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromomethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichlorodifluoromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Hexachlorobutadiene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U

GROUNDWATER ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-gw27	SWMU360-gw28	SWMU360-gw28-1	SWMU360-gw28-2	SWMU360-gw29	SWMU360-gw29-2	SWMU360-gw29-3	SWMU360-gw30
Lab Sample I.D.	03-0302	03-0303	03-0304	03-0305	03-0322	03-0323	03-0324	03-0306
Sample Date	Missing	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Isopropylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
meta,para-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
ortho-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
para-Isopropyltoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
sec-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Styrene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
tert-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	1 J	2 U	2 U	2 U	2 U	2 U	2 U
Toluene	2 U	2 U	2 U	2 U	1 J	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Trichloroethene	2 U	2 U	2 U	2 U	5	6	5	2 U
Trichlorofluoromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl Chloride	2 U	2 U	2 U	2 U	2 U	1 J	1 J	2 U

GROUNDWATER ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-gw30-1	SWMU360-gw30-2	SWMU360-gw31	SWMU360-gw31-2	SWMU360-gw31-3	SWMU360-gw32-02	SWMU360-gw32-03
Lab Sample I.D.	03-0307	03-0308	03-0325	03-0326	03-0327	03-0340	03-0341
Sample Date	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Volatiles (ug/l)							
1,1,1,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,1-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2,2-Tetrachloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1,2-Trichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,1-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,3-Trichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,3-Trichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,4-Trichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2,4-Trimethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromoethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3,5-Trimethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,4-Dichlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2,2-Dichloropropane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Chlorotoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Benzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromochloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromodichloroemethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromoform	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Bromomethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon Tetrachloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chlorobenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chloroform	2 U	2 U	2 J	2 U	2 U	2 U	2 U
Chloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
cis-1,2-Dichloroethene	2 U	2 U	26	17	17	25	25
cis-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromochloromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromomethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dichlorodifluoromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Hexachlorobutadiene	2 U	2 U	2 U	2 U	2 U	2 U	2 U

GROUNDWATER ANALYTICAL RESULTS - MOBILE LAB DATA
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-gw30-1	SWMU360-gw30-2	SWMU360-gw31	SWMU360-gw31-2	SWMU360-gw31-3	SWMU360-gw32-02	SWMU360-gw32-03
Lab Sample I.D.	03-0307	03-0308	03-0325	03-0326	03-0327	03-0340	03-0341
Sample Date	Missing	Missing	Missing	Missing	Missing	Missing	Missing
Isopropylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
meta,para-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methylene Chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
ortho-Xylene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
para-Isopropyltoluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
sec-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Styrene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
tert-Butylbenzene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	2 U	2 U	13	4	8	14	10
Toluene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
trans-1,3-Dichloropropene	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Trichloroethene	2 U	2 U	6	2	4	6	4
Trichlorofluoromethane	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl Chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U

SHALLOW MONITORING WELLS ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	1817-MW01	SWMU360-MW01	SWMU360-MW02	SWMU360-MW03	SWMU360-MW04	SWMU360-MW05	SWMU360-MW06	SWMU360-MW07	SWMU360-MW08
Sample Date	07-24-2003	07-24-2003	07-24-2003	07-22-2003	07-22-2003	07-22-2003	07-22-2003	07-22-2003	07-22-2003
VOLATILES (ug/L)									
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichlorotrifluoroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-Chloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	6.9 J	10 U	10 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	750 DL	42	31	10 U	32	10 U	10 U	2.4 J	31
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethyl Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
m/p-Xylenes	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Methyl Acetate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl Ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
o-Xylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	5100 DL	160	10 U	10 U	17	10 U	10 U	10 U	10 U
Toluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	3 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	460 DL	13	6.7 J	10 U	8.2 J	10 U	10 U	10 U	5.5 J
Trichlorofluoromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
SEMIVOLATILES (ug/L)									
1,1-Biphenyl		10 UJ	10 UJ					10 UJ	
2,2-oxybis(1-Chloropropane)		10 UJ	10 UJ					10 UJ	
2,4,5-Trichlorophenol		10 UJ	10 UJ					10 UJ	
2,4,6-Trichlorophenol		10 UJ	10 UJ					10 UJ	
2,4-Dichlorophenol		10 UJ	10 UJ					10 UJ	
2,4-Dimethylphenol		10 UJ	10 UJ					10 UJ	
2,4-Dinitrophenol		21 UJ	21 UJ					21 UJ	
2,4-Dinitrotoluene		10 UJ	10 UJ					10 UJ	
2,6-Dinitrotoluene		10 UJ	10 UJ					10 UJ	

SHALLOW MONITORING WELLS ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	1817-MW01	SWMU360-MW01	SWMU360-MW02	SWMU360-MW03	SWMU360-MW04	SWMU360-MW05	SWMU360-MW06	SWMU360-MW07	SWMU360-MW08
Sample Date	07-24-2003	07-24-2003	07-24-2003	07-22-2003	07-22-2003	07-22-2003	07-22-2003	07-22-2003	07-22-2003
2-Chloronaphthalene		10 UJ	10 UJ					10 UJ	
2-Chlorophenol		10 UJ	10 UJ					10 UJ	
2-Methylnaphthalene		10 UJ	10 UJ					10 UJ	
2-Methylphenol		10 UJ	10 UJ					10 UJ	
2-Nitroaniline		10 UJ	10 UJ					10 UJ	
2-Nitrophenol		10 UJ	10 UJ					10 UJ	
3+4-Methylphenols		10 UJ	10 UJ					10 UJ	
3,3-Dichlorobenzidine		21 UJ	21 UJ					21 UJ	
3-Nitroaniline		10 UJ	10 UJ					10 UJ	
4,6-Dinitro-2-methylphenol		21 UJ	21 UJ					21 UJ	
4-Bromophenyl-phenylether		10 UJ	10 UJ					10 UJ	
4-Chloro-3-methylphenol		10 UJ	10 UJ					10 UJ	
4-Chloroaniline		10 UJ	10 UJ					10 UJ	
4-Chlorophenyl-phenylether		10 UJ	10 UJ					10 UJ	
4-Nitroaniline		10 UJ	10 UJ					10 UJ	
4-Nitrophenol		21 UJ	21 UJ					21 UJ	
Acenaphthene		10 UJ	10 UJ					10 UJ	
Acenaphthylene		10 UJ	10 UJ					10 UJ	
Acetophenone		10 UJ	10 UJ					10 UJ	
Anthracene		10 UJ	10 UJ					10 UJ	
Atrazine		10 UJ	10 UJ					10 UJ	
Benzaldehyde		10 UJ	10 UJ					10 UJ	
Benzo(a)anthracene		10 UJ	10 UJ					10 UJ	
Benzo(a)pyrene		10 UJ	10 UJ					10 UJ	
Benzo(b)fluoranthene		10 UJ	10 UJ					10 UJ	
Benzo(g,h,i)perylene		10 UJ	10 UJ					10 UJ	
Benzo(k)fluoranthene		10 UJ	10 UJ					10 UJ	
Butylbenzylphthalate		10 UJ	10 UJ					10 UJ	
Caprolactam		10 UJ	10 UJ					10 UJ	
Carbazole		10 UJ	10 UJ					10 UJ	
Chrysene		10 UJ	10 UJ					10 UJ	
Di-n-butylphthalate		10 UJ	10 UJ					10 UJ	
Di-n-octyl phthalate		10 UJ	10 UJ					10 UJ	
Dibenz(a,h)anthracene		10 UJ	10 UJ					10 UJ	
Dibenzofuran		10 UJ	10 UJ					10 UJ	
Diethylphthalate		10 UJ	10 UJ					10 UJ	
Dimethylphthalate		10 UJ	10 UJ					10 UJ	
Fluoranthene		10 UJ	10 UJ					10 UJ	
Fluorene		10 UJ	10 UJ					10 UJ	
Hexachlorobenzene		10 UJ	10 UJ					10 UJ	
Hexachlorobutadiene		10 UJ	10 UJ					10 UJ	
Hexachlorocyclopentadiene		10 UJ	10 UJ					10 UJ	
Hexachloroethane		10 UJ	10 UJ					10 UJ	
Indeno(1,2,3-cd)pyrene		10 UJ	10 UJ					10 UJ	
Isophorone		10 UJ	10 UJ					10 UJ	
N-Nitroso-di-n-propylamine		10 UJ	10 UJ					10 UJ	
N-Nitrosodiphenylamine		10 UJ	10 UJ					10 UJ	
Naphthalene		10 UJ	10 UJ					10 UJ	
Nitrobenzene		10 UJ	10 UJ					10 UJ	
Pentachlorophenol		21 UJ	21 UJ					21 UJ	
Phenanthrene		10 UJ	10 UJ					10 UJ	
Phenol		10 UJ	10 UJ					10 UJ	
Pyrene		10 UJ	10 UJ					10 UJ	
bis(2-Chloroethoxy)methane		10 UJ	10 UJ					10 UJ	
bis(2-Chloroethyl)ether		10 UJ	10 UJ					10 UJ	
bis(2-Ethylhexyl)phthalate		10 UJ	10 UJ					10 UJ	
PESTICIDES (ug/L)									
4,4-DDD	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
4,4-DDE	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
4,4-DDT	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Aldrin	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U
alpha-BHC	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U

SHALLOW MONITORING WELLS ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	1817-MW01	SWMU360-MW01	SWMU360-MW02	SWMU360-MW03	SWMU360-MW04	SWMU360-MW05	SWMU360-MW06	SWMU360-MW07	SWMU360-MW08
Sample Date	07-24-2003	07-24-2003	07-24-2003	07-22-2003	07-22-2003	07-22-2003	07-22-2003	07-22-2003	07-22-2003
alpha-Chlordane	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U
beta-BHC	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U
delta-BHC	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U
Dieldrin	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endosulfan I	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U
Endosulfan II	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endosulfan Sulfate	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endrin	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endrin aldehyde	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Endrin ketone	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
gamma-BHC	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U
gamma-Chlordane	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U
Heptachlor	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U
Heptachlor epoxide	0.051 U	0.051 U	0.052 UJ	0.051 UJ	0.052 UJ	0.052 UJ	0.052 UJ	0.051 UJ	0.052 U
Methoxychlor	0.51 U	0.51 U	0.52 UJ	0.51 UJ	0.52 UJ	0.52 UJ	0.52 UJ	0.51 UJ	0.52 U
Toxaphene	5.1 U	5.1 U	5.2 UJ	5.1 UJ	5.2 UJ	5.2 UJ	5.2 UJ	5.1 UJ	5.2 U
TOTAL METALS (ug/L)									
Arsenic	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Barium	60.8 J	28 J	30.8 J	38.2 J	34.7 J	145 J	27.9 J	32 J	35.8 J
Cadmium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chromium	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Lead	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	2.1 J	1.6 U	1.6 U
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Selenium	5.7	5.2	2.6 U	2.6 U	3.6 J	4.4 J	2.6 U	2.6 U	2.6 U
Silver	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ

DUPLICATES IN SHALLOW MONITORING WELLS ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-MW01D
Lab Sample I.D.	R3521-02
Sample Date	07-24-2003
VOLATILES (ug/L)	
1,1,1-Trichloroethane	10 U
1,1,2,2-Tetrachloroethane	10 U
1,1,2-Trichloroethane	10 U
1,1,2-Trichlorotrifluoroethane	10 U
1,1-Dichloroethane	10 U
1,1-Dichloroethene	10 U
1,2,4-Trichlorobenzene	10 U
1,2-Dibromo-3-Chloropropane	10 U
1,2-Dibromoethane	10 U
1,2-Dichlorobenzene	10 U
1,2-Dichloroethane	10 U
1,2-Dichloropropane	10 U
1,3-Dichlorobenzene	10 U
1,4-Dichlorobenzene	10 U
2-Butanone	10 U
2-Hexanone	10 U
4-Methyl-2-Pentanone	10 U
Acetone	10 U
Benzene	10 U
Bromodichloromethane	10 U
Bromoform	10 U
Bromomethane	10 U
Carbon Disulfide	10 U
Carbon Tetrachloride	10 U
Chlorobenzene	10 U
Chloroethane	10 U
Chloroform	10 U
Chloromethane	10 U
cis-1,2-Dichloroethene	43
cis-1,3-Dichloropropene	10 U
Cyclohexane	10 U
Dibromochloromethane	10 U
Dichlorodifluoromethane	10 U

DUPLICATES IN SHALLOW MONITORING WELLS ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-MW01D
Lab Sample I.D.	R3521-02
Sample Date	07-24-2003
VOLATILES (ug/L) (cont.)	
Ethyl Benzene	10 U
Isopropylbenzene	10 U
m/p-Xylenes	20 U
Methyl Acetate	10 U
Methyl tert-butyl Ether	10 U
Methylcyclohexane	10 U
Methylene Chloride	10 U
o-Xylene	10 U
Styrene	10 U
Tetrachloroethene	160
Toluene	10 U
trans-1,2-Dichloroethene	10 U
trans-1,3-Dichloropropene	10 U
Trichloroethene	13
Trichlorofluoromethane	10 U
Vinyl Chloride	10 U
PESTICIDES (ug/L)	
4,4-DDD	0.1 UJ
4,4-DDE	0.1 UJ
4,4-DDT	0.1 UJ
Aldrin	0.052 UJ
alpha-BHC	0.052 UJ
alpha-Chlordane	0.052 UJ
beta-BHC	0.052 UJ
delta-BHC	0.052 UJ
Dieldrin	0.1 UJ
Endosulfan I	0.052 UJ
Endosulfan II	0.1 UJ
Endosulfan Sulfate	0.1 UJ
Endrin	0.1 UJ
Endrin aldehyde	0.1 UJ
Endrin ketone	0.1 UJ
gamma-BHC	0.052 UJ
gamma-Chlordane	0.052 UJ

DUPLICATES IN SHALLOW MONITORING WELLS ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-MW01D
Lab Sample I.D.	R3521-02
Sample Date	07-24-2003
Heptachlor	0.052 UJ
Heptachlor epoxide	0.052 UJ
Methoxychlor	0.52 UJ
Toxaphene	5.2 UJ
TOTAL METALS (ug/L)	
Arsenic	3.6 U
Barium	26.2 J
Cadmium	1 U
Chromium	0.8 U
Lead	1.6 U
Mercury	0.2 U
Selenium	2.6 U
Silver	1.7 UJ

DEEP MONITORING WELLS ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-MW01IW	SWMU360-MW02IW	SWMU360-MW03IW
Lab Sample I.D.	R3521-03	R3521-07	R3486-02
Sample Date	07-24-2003	07-24-2003	07-22-2003
Volatiles (ug/L)			
1,1,1-Trichloroethane	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U
1,1,2-Trichlorotrifluoroethane	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U
1,2-Dibromo-3-Chloropropane	10 U	10 U	10 U
1,2-Dibromoethane	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U
4-Methyl-2-Pentanone	10 U	10 U	10 U
Acetone	10 U	10 U	10 U
Benzene	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U
Carbon Disulfide	10 U	10 U	10 U
Carbon Tetrachloride	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U
Chloroform	10 U	10 U	1.1 J
Chloromethane	10 U	10 U	10 U
cis-1,2-Dichloroethene	10 U	37	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U
Cyclohexane	10 U	10 U	10 U
Dibromochloromethane	10 U	10 U	10 U
Dichlorodifluoromethane	10 U	10 U	10 U
Ethyl Benzene	10 U	10 U	10 U
Isopropylbenzene	10 U	10 U	10 U
m/p-Xylenes	20 U	20 U	20 U
Methyl Acetate	10 U	10 U	10 U
Methyl tert-butyl Ether	10 U	10 U	10 U
Methylcyclohexane	10 U	10 U	10 U
Methylene Chloride	10 U	10 U	10 U
o-Xylene	10 U	10 U	10 U
Styrene	10 U	10 U	10 U
Tetrachloroethene	8.1 J	10 U	10 U
Toluene	10 U	10 U	10 U
trans-1,2-Dichloroethene	10 U	10 U	10 U

DEEP MONITORING WELLS ANALYTICAL RESULTS
SWMU 360
RCRA INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D.	SWMU360-MW01IW	SWMU360-MW02IW	SWMU360-MW03IW
Lab Sample I.D.	R3521-03	R3521-07	R3486-02
Sample Date	07-24-2003	07-24-2003	07-22-2003
trans-1,3-Dichloropropene	10 U	10 U	10 U
Trichloroethene	10 U	8.5 J	10 U
Trichlorofluoromethane	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U
Pesticides (ug/L)			
4,4-DDD	0.1 UJ	0.1 UJ	0.1 UJ
4,4-DDE	0.1 UJ	0.1 UJ	0.1 UJ
4,4-DDT	0.1 UJ	0.1 UJ	0.1 UJ
Aldrin	0.052 UJ	0.051 UJ	0.052 UJ
alpha-BHC	0.052 UJ	0.051 UJ	0.052 UJ
alpha-Chlordane	0.052 UJ	0.051 UJ	0.052 UJ
beta-BHC	0.052 UJ	0.051 UJ	0.052 UJ
delta-BHC	0.052 UJ	0.051 UJ	0.052 UJ
Dieldrin	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan I	0.052 UJ	0.051 UJ	0.052 UJ
Endosulfan II	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan Sulfate	0.1 UJ	0.1 UJ	0.1 UJ
Endrin	0.1 UJ	0.1 UJ	0.1 UJ
Endrin aldehyde	0.1 UJ	0.1 UJ	0.1 UJ
Endrin ketone	0.1 UJ	0.1 UJ	0.1 UJ
gamma-BHC	0.052 UJ	0.051 UJ	0.052 UJ
gamma-Chlordane	0.052 UJ	0.051 UJ	0.052 UJ
Heptachlor	0.052 UJ	0.051 UJ	0.052 UJ
Heptachlor epoxide	0.052 UJ	0.051 UJ	0.052 UJ
Methoxychlor	0.52 UJ	0.51 UJ	0.52 UJ
Toxaphene	5.2 UJ	5.1 UJ	5.2 UJ
Total Metals (ug/L)			
Arsenic	3.6 U	3.6 U	3.6 U
Barium	22.4 J	34.8 J	25.1 J
Cadmium	1 U	1 U	1 U
Chromium	0.8 U	0.8 U	0.8 U
Lead	2.5 J	1.6 U	1.6 U
Mercury	0.2 U	0.2 U	0.2 U
Selenium	2.6 U	2.6 U	2.6 U
Silver	1.7 UJ	1.7 UJ	1.7 UJ

SUBSURFACE SOILS STATISTICAL SUMMARY
MOBILE LAB DATA
SWMU 360
RCRA FACILITY INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Minimum Non-Detect	Maximum Non-Detect	Minimum Detected	Maximum Detected	Frequency of Detection	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Degree of Freedom	H Statistic	Log Upper 95% Confidence Level	Location of Maximum Detect
Volatiles (ug/kg)														
1,1-Dichloroethene	2 U	2 U	2	9	8/71	1.2817	1.1108	1.5014	0.12	0.39	70	1.794	1.3278	SWMU360-SB04-10
Benzene	2 U	2 U	5	5	2/71	1.1127	0.6665	1.2446	0.05	0.27	70	1.745	1.1471	SWMU360-SB04-06, SWMU360-SB04-08
cis-1,2-Dichloroethene	2 U	2 U	1	237	13/71	8.493	37.3508	15.882	0.44	1.14	70	2.507	4.2125	SWMU360-SB04-08
Tetrachloroethene	2 U	2 U	2	118	29/71	12.3239	25.3133	17.3315	1.07	1.53	70	3.089	16.5856	SWMU360-SB06-01
Trichloroethene	2 U	2 U	2	23	11/71	1.6338	2.711	2.1701	0.21	0.55	70	1.916	1.6208	SWMU360-SB07-02
trans-1,2-Dichloroethene	2 U	2 U	2	4	3/71	1.0845	0.439	1.1713	0.04	0.22	70	1.745	1.123	SWMU360-SB04-08

SUBSURFACE SOIL STATISTICAL SUMMARY
SWMU 360
RCRA FACILITY INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Minimum Non-Detect	Maximum Non-Detect	Minimum Detected	Maximum Detected	Frequency of Detection	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Location of Maximum Detect
Volatiles (ug/kg)												
2-Butanone	11 U	12 U	3.8 J	3.8 J	1/16	5.4563	0.4732	5.6637	1.69	0.1	5.711	SWMU360-SB04-02
Acetone	11 U	21 U	26	26	1/16	7.5313	5.1752	9.7994	1.91	0.42	9.161	SWMU360-SB16-09
Benzene	11 U	12 U	1.5 J	1.5 J	1/16	5.3125	1.0308	5.7643	1.63	0.33	6.3891	SWMU360-SB04-02
Carbon Disulfide	11 U	12 U	2 J	2 J	1/16	5.3438	0.9077	5.7416	1.65	0.26	6.1101	SWMU360-SB16-09
cis-1,2-Dichloroethene	11 U	12 U	13	13	1/16	6.0313	1.8661	6.8491	1.77	0.21	6.658	SWMU360-SB04-02
Ethyl Benzene	11 U	12 U	63	63	1/16	9.1563	14.3593	15.4494	1.87	0.61	11.1344	SWMU360-SB04-02
Isopropylbenzene	11 U	12 U	6.1 J	6.1 J	1/16	5.6	0.216	5.6947	1.72	0.04	5.6955	SWMU360-SB04-02
m/p-Xylenes	11 U	12 U	230	230	1/16	19.5938	56.1086	44.1841	1.95	0.93	20.7431	SWMU360-SB04-02
Methylcyclohexane	11 U	12 U	1.3 J	1.3 J	1/16	5.3	1.0801	5.7734	1.63	0.36	6.5274	SWMU360-SB04-02
o-Xylene	11 U	12 U	100	100	1/16	11.4688	23.6089	21.8157	1.9	0.72	13.5754	SWMU360-SB04-02
Tetrachloroethene	11 U	12 U	1.4 J	7.9 J	2/16	5.425	1.231	5.9645	1.65	0.36	6.6516	SWMU360-SB06-11
Toluene	11 U	12 U	9.7 J	9.7 J	1/16	5.825	1.0472	6.2839	1.75	0.14	6.2167	SWMU360-SB04-02
trans-1,2-Dichloroethene	11 U	12 U	0.92 J	0.92 J	1/16	5.2763	1.174	5.7908	1.6	0.45	6.9882	SWMU360-SB04-02
Metals (mg/kg)												
Arsenic	0.58 U	0.68 U	0.65 J	7.9	20/46	1.0632	1.5556	1.4484	-0.48	0.92	1.3003	SWMU360-SB06-11
Barium	0	0	2.6 J	29.4 J	46/46	10.437	5.9073	11.8998	2.18	0.61	12.8381	SWMU360-SB10-03
Cadmium	0.08 U	0.1 U	0.11 J	0.58 J	3/46	0.0597	0.0796	0.0794	-3	0.42	0.0608	SWMU360-SB03-01
Chromium	0.12 U	4.5 U	1 J	14.7	28/46	4.081	4.2716	5.1387	0.39	1.84	21.5817	SWMU360-SB04-06
Lead	0	0	0.67 J	23.4 J	46/46	3.877	3.8568	4.832	1.04	0.79	4.9537	SWMU360-SB03-01
Selenium	0.62 UJ	0.74 U	0.84 J	0.87 J	2/46	0.3589	0.108	0.3856	-1.05	0.2	0.3754	SWMU360-SB08-02

GROUNDWATER STATISTICAL SUMMARY
MOBILE LAB DATA
SWMU 360
RCRA FACILITY INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

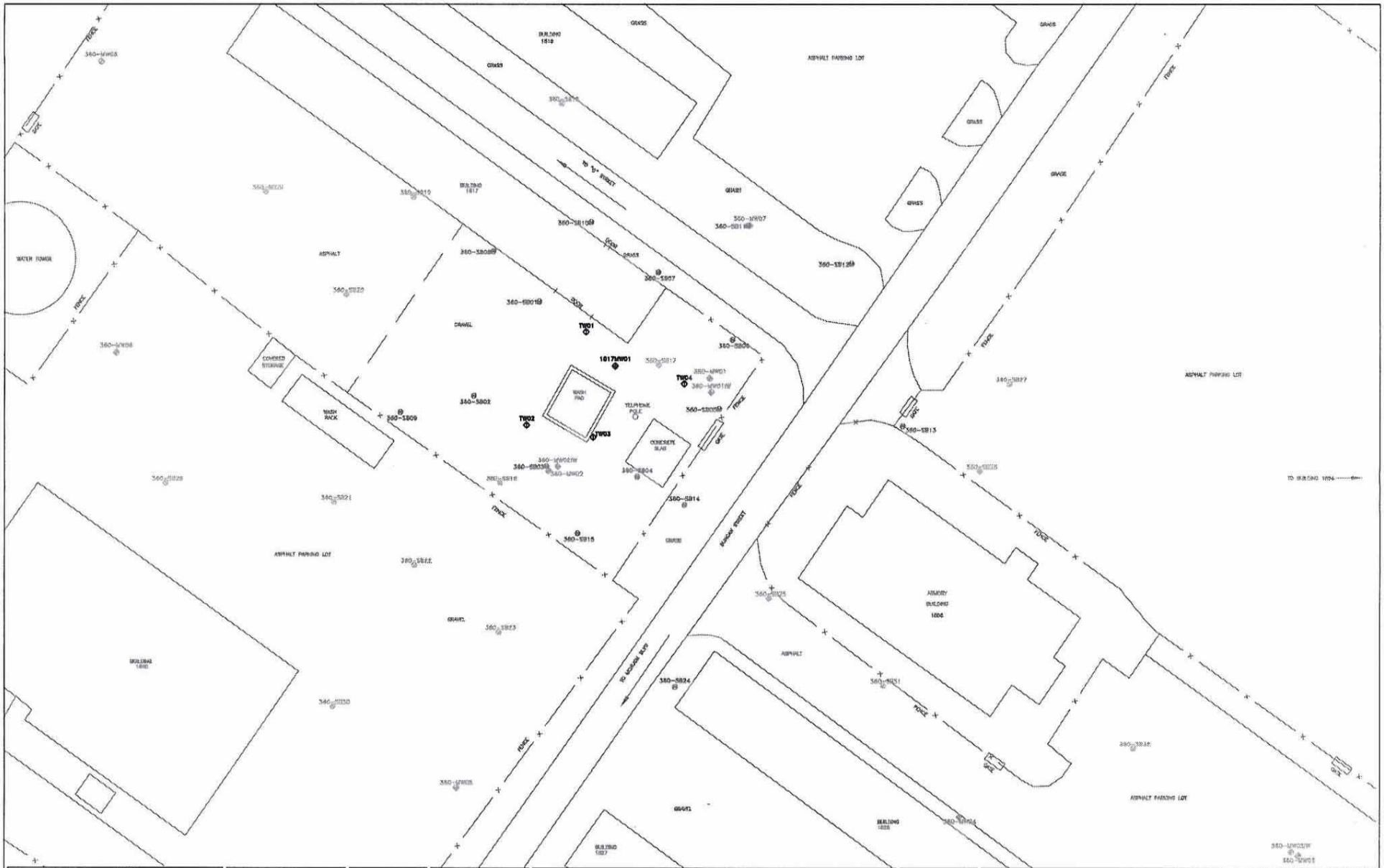
	Minimum Non-Detect	Maximum Non-Detect	Minimum Detected	Maximum Detected	Frequency of Detection	Arithmatic Mean Positive Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Degree of Freedom	H Statistic	Log Upper 95% Confidence Level	Location of Maximum Detect
Volatiles (ug/l)														
1,1-Dichloroethene	1 U	2 U	1 J	7	10/59	1.8	0.8604	1.1533	-0.18	0.46	58	1.876	1.0443	SWMU360-GW03
1,2,3-Trichloropropane	2 U	2 U	2	2	1/31	2	0.1796	1.087	0.02	0.12	30	1.742	1.0722	SWMU360-gw24-2
Chloroform	2 U	2 U	1 J	6	8/31	2.38	1.0503	1.675	0.17	0.44	30	1.928	1.5181	SWMU360-gw23
cis-1,2-Dichloroethene	1 U	2 U	1	316	43/59	32.26	42.9328	33.0971	2.09	1.7	58	3.2	69.3391	SWMU360-GW03
Tetrachloroethene	0.5 U	2 U	0.5	211.7	24/59	13.56	27.4847	11.9117	0.19	1.36	58	2.881	5.1215	SWMU360-GW05
Toluene	2 U	2 U	1 J	3	4/31	2	0.4275	1.2593	0.08	0.26	30	1.793	1.2176	SWMU360-gw21
trans-1,2-Dichloroethene	1 U	2 U	4	4	1/59	4	0.4892	0.9285	-0.29	0.41	58	1.876	0.8977	SWMU360-GW03
Trichloroethene	1 U	2 U	1 J	55	37/59	7.19	8.0655	6.5603	0.88	1.15	58	2.58	6.8958	SWMU360-GW03
Vinyl Chloride	2 U	2 U	1 J	2 J	4/31	1.25	0.1796	1.087	0.02	0.12	30	1.742	1.0722	SWMU360-gw21-2

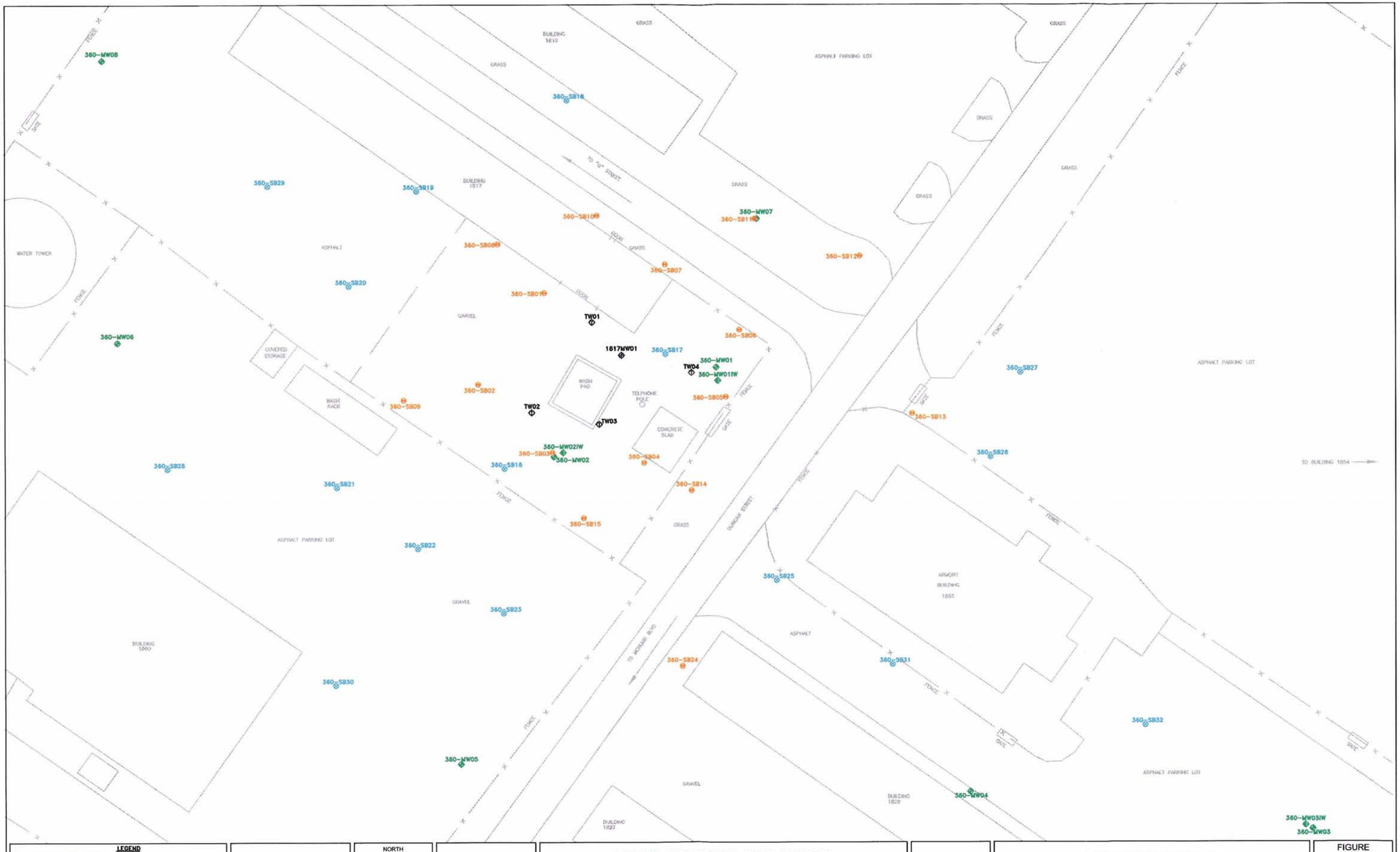
SHALLOW MONITORING WELLS
STATISTICAL SUMMARY
SWMU 360
RCRA FACILITY INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Sample I.D. Lab Sample I.D. Sample Date	Minimum Non-Detect	Maximum Non-Detect	Minimum Detected	Maximum Detected	Frequency of Detection	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Location of Maximum Detect
VOLATILES (ug/L)												
Chloroform	10 U	10 U	6.9 J	6.9 J	1/9	5.2111	0.6333	5.6037	1.65	0.11	5.6036	SWMU360-MW06
cis-1,2-Dichloroethene	10 U	10 U	2.4 J	750 DL	6/9	100.3778	244.0823	251.6721	2.93	1.75	2978.5554	1817-MW01
Tetrachloroethene	10 U	10 U	17	5100 DL	3/9	589.6667	1692.1391	1638.5382	2.9	2.41	132122.108	1817-MW01
trans-1,2-Dichloroethene	10 U	10 U	3 J	3 J	1/9	4.7778	0.6667	5.1911	1.55	0.17	5.3767	1817-MW01
Trichloroethene	10 U	10 U	5.5 J	460 DL	5/9	57.0444	151.1311	150.7229	2.32	1.47	295.8521	1817-MW01
METALS (ug/L)												
Barium	0	0	27.9 J	145 J	9/9	48.1333	37.6668	71.481	3.71	0.53	74.2833	SWMU360-MW05
Lead	1.6 U	1.6 U	2.1 J	2.1 J	1/9	0.9444	0.4333	1.213	-0.12	0.32	1.1955	SWMU360-MW06
Selenium	2.6 U	2.6 U	3.6 J	5.7	4/9	2.8222	1.8913	3.9945	0.83	0.68	5.4504	1817-MW01

INTERMEDIATE MONITORING WELLS
STATISTICAL SUMMARY
SWMU 360
RCRA FACILITY INVESTIGATION - CTO-0143
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Minimum Non-Detect	Maximum Non-Detect	Minimum Detected	Maximum Detected	Frequency of Detection	Arithmatic Mean Half Non-Detects	Standard Deviation	Upper 95% Confidence Level	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Upper 95% Confidence Level	Location of Maximum Detect
Volatiles (ug/L)												
Chloroform	10 U	10 U	1.1 J	1.1 J	1/3	3.7	2.2517	7.496	1.1	0.87	6272.4737	SWMU360-MW03IW
cis-1,2-Dichloroethene	10 U	10 U	37	37	1/3	15.6667	18.4752	46.8132	2.28	1.16	11852874.6	SWMU360-MW02IW
Tetrachloroethene	10 U	10 U	8.1 J	8.1 J	1/3	6.0333	1.7898	9.0506	1.77	0.28	13.7105	SWMU360-MW01IW
Trichloroethene	10 U	10 U	8.5 J	8.5 J	1/3	6.1667	2.0207	9.5733	1.79	0.31	19.3791	SWMU360-MW02IW
Metals (ug/L)												
Barium	0	0	22.4 J	34.8 J	3/3	27.4333	6.521	38.4268	3.29	0.23	53.7552	SWMU360-MW02IW
Lead	1.6 U	1.6 U	2.5 J	2.5 J	1/3	1.3667	0.9815	3.0214	0.16	0.66	101.0677	SWMU360-MW01IW


LEGEND
PHASE II TEMPORARY WELL
EXISTING MONITORING WELL
MONITORING WELL LOCATION
INTERMEDIATE MONITORING WELL LOCATION
SOIL BORING AND GROUND WATER GRAB LOCATION
GROUND WATER GRAB LOCATION
SOURCE: MCB CAMP LEJEUNE MARCH 2000
DRAWN JRR
REVIEWED RMS
S.O.# 26007-143-0000-06001
CADD# 3143RFI_360_BASE
NORTH
1" = 25'
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA
BAKER ENVIRONMENTAL, Inc.
Moon Township, Pennsylvania
Baker
RCRA FACILITY INVESTIGATION
SOIL BORING, GROUNDWATER GRAB
AND MONITORING WELL LOCATION MAP
SWMU 360, CTO-143
SCALE 1" = 25'
DATE 8/20/03
FIGURE
2-1



LEGEND

- PHASE II TEMPORARY WELL
- EXISTING MONITORING WELL
- MONITORING WELL LOCATION
- INTERMEDIATE MONITORING WELL LOCATION
- SOIL BORING AND GROUND WATER GRAB LOCATION
- GROUND WATER GRAB LOCATION

SOURCE: MCB CAMP LEJEUNE MARCH 2000

DRAWN	/RRR
REVIEWED	RMS
S.O.#	26007-143-0000-06001
CADD#	3143RFI_360_BASE

NORTH

0 1 inch = 65 ft 65

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Moon Township, Pennsylvania

Baker

RCRA FACILITY INVESTIGATION
SOIL BORING, GROUNDWATER GRAB
AND MONITORING WELL LOCATION MAP
SWMU 360, CTO-143

SCALE 1" = 25'

DATE 8/20/03

FIGURE
2-1

Appendix B

Analytical Laboratory Data for Soil and Groundwater Samples

TOD SAMPLE ANALYSES
CH2M Hill, Raleigh, North Carolina
Camp LeJeune, SWMU 360 (CTO-100, Mod 2)
DATE TITRATED: December 20, 2005
DATE PREPARED: December 16, 2005
SAMPLES RECEIVED: December 16, 2005
OXIDANTS: Potassium Permanganate

Sample ID	Oxidant	Oxidant Demand (g/kg)
IS34	Potassium Permanganate	< 0.05
IS35	Potassium Permanganate	0.41
IS36	Potassium Permanganate	15
IS-37	Potassium Permanganate	< 0.05

TOD is reported in grams of oxidant per kilogram of saturated aquifer material.
TOD testing for permanganate completed per Haselow *et al., 2003.* Estimating the Total Oxidant Demand for In Situ Chemical Oxidation Design, Remediation, Autumn, 2003. All samples dosed at 10 g/kg except IS36, dosed at 15 g/kg.

1006A MORRISVILLE PKWY, MORRISVILLE, NC 27560 TEL 919.460.0330 FAX 919.460.0211
WWW.REDOX-TECH.COM E-MAIL: HASELOW@REDOX-TECH.COM

CTO-100
SWMU360 Camp Lejeune
December 2005 and January 2006 Validated GW Raw Data

Sample ID	SWMU360-GW37-22-26	SWMU360-GW37-38-42	SWMU360-GW38-22-26	SWMU360-GW38-P-22-26	SWMU360-GW39-22-26	SWMU360-GW39-38-42	SWMU360-GW40-22-26	SWMU360-GW40-38-42	SWMU360-GW41-22-26	SWMU360-GW42-22-26	SWMU360-GW43-22-26	SWMU360-GW44-22-26
Sample Date	12/14/05	12/14/05	12/15/05	12/15/05	12/15/05	12/15/05	12/15/05	12/15/05	12/14/05	12/14/05	12/15/05	12/15/05
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	0.72 J	5 U	5 U	5 U	5 U	5 U	0.56 J	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	0.97 J	5 U	5 U	5 U	5 U	5 U	0.58 J	5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	1.9 J	4.9 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Benzene	0.2 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon disulfide	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U	5 U	5 U	5 U	0.32 J	5 U	5 U	8.5	0.61 J	1.8 J
Chloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	120	5.8	1.2 J	1.3 J	0.84 J	0.43 J	24	9.5	1.5 J	0.67 J	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cumene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dichlorodifluoromethane (Freon-12)	5 U	5 U	5 U	5 U	5 U	1.9 J	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	1 J	0.41 J	1.3 J	0.78 J	1.3 J	0.47 J	1 J	0.42 J	5 U	5 U	5 U	5 U
Methyl acetate	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylcyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl-tert-butyl ether (MTBE)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	180	0.83 J	5 U	5 U	5 U	5 U	11	4 J	1.4 J	5 U	0.81 J	3.4 J
Toluene	0.51 J	5 U	0.53 J	0.4 J	0.57 J	0.32 J	0.42 J	0.3 J	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	1.4 J	0.43 J	5 U	5 U	5 U	5 U	0.52 J	0.4 J	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	54	0.94 J	0.59 J	0.58 J	0.38 J	5 U	5.6	2.4 J	5 U	5 U	0.35 J	5 U
Trichlorofluoromethane(Freon-11)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	0.51 J	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Xylene, total	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

Notes:
U- Analyte not detected
J- Reported value is estimated

CTO-100
SWMU360 Camp Lejeune
December 2005 and January 2006 Validated GW Raw Data

Sample ID	SWMU360-MW09IW	SWMU360-MW10	SWMU360-MW10IW	SWMU360-MW10-P	SWMU360-MW11	SWMU360-MW12	1817-MW01	1817-MW01-P	IR78-GW39-06A
Sample Date	1/18/06	1/18/06	1/18/06	1/18/06	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06
Chemical Name									
Volatile Organic Compounds (UG/L)									
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dibromo-3-chloropropane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dibromoethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,3-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,4-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U	10 U
Acetone	12 J	20 U	20 U	20 U	20 U	1.9 J	1000 U	1000 U	20 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U	13 J	250 U	5 U
Bromodichloromethane	0.34 J	0.5 J	0.35 J	0.54 J	5 U	0.34 J	250 U	250 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Bromomethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Carbon disulfide	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Carbon tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Chloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Chloroform	3.7 J	1.5 J	1.6 J	1.7 J	5 U	1 J	250 U	250 U	5 U
Chloromethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
cis-1,2-Dichloroethene	5 U	14	16	13	1.2 J	16	370	360	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Cumene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Cyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Dichlorodifluoromethane (Freon-12)	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Methyl acetate	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Methylcyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Methyl-tert-butyl ether (MTBE)	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Tetrachloroethene	5 U	9	9.3	8.8	5 U	12	3,100	3,200	0.69 J
Toluene	1.2 J	5 U	0.28 J	5 U	5 U	0.21 J	250 U	250 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	0.56 J	5 U	5 U	5 U	250 U	250 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Trichloroethene	5 U	3.2 J	3.3 J	3 J	0.4 J	4.1 J	200 J	190 J	5 U
Trichlorofluoromethane(Freon-11)	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Vinyl chloride	2 U	2 U	2 U	2 U	2 U	2 U	100 U	100 U	2 U
Xylene, total	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U

Notes:
U- Analyte not detected
J- Reported value is estimated

CTO-100
MCB Camp Lejeune SWMU360
Validated Soil Raw Data
December 2005

Sample ID	SWMU360-IS34-1-3	SWMU360-IS34-16-18	SWMU360-IS35-1-3	SWMU360-IS35-14-16	SWMU360-IS36-1-3	SWMU360-IS36-17-19	SWMU360-IS37-1-3	SWMU360-IS37-17-19	SWMU360-IS37-P-1-3	SWMU360-IS45-1-3	SWMU360-IS45-17-19
Sample Date	12/13/05	12/13/05	12/13/05	12/13/05	12/14/05	12/14/05	12/14/05	12/14/05	12/14/05	12/13/05	12/13/05
Chemical Name											
Volatile Organic Compounds (UG/KG)											
1,1,1-Trichloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1,2,2-Tetrachloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-1	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1,2-Trichloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1-Dichloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1-Dichloroethene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2,4-Trichlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dibromo-3-chloropropane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dibromoethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dichlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dichloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dichloropropane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,3-Dichlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,4-Dichlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
2-Butanone	9.6 U	9.6 U	11 U	9.9 U	8.6 U	8.6 U	8.8 U	8.9 U	8.5 U	9.5 U	9.6 U
2-Hexanone	9.6 U	9.6 U	11 U	9.9 U	8.6 U	8.6 U	8.8 U	8.9 U	8.5 U	9.5 U	9.6 U
4-Methyl-2-pentanone	9.6 U	9.6 U	11 U	9.9 U	8.6 U	8.6 U	8.8 U	8.9 U	8.5 U	9.5 U	9.6 U
Acetone	21	8.5 J	21 U	20 U	17 U	17 U	18 U	18 U	17 U	19 U	19 U
Benzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Bromodichloromethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Bromoform	4.8 U	4.8 U	5.3 U	5 U	4.3 U	0.6 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Bromomethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Carbon disulfide	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Carbon tetrachloride	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Chlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Chloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Chloroform	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Chloromethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
cis-1,2-Dichloroethene	6.7	4.8 U	5.3 U	17	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
cis-1,3-Dichloropropene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Cumene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Cyclohexane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Dibromochloromethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Dichlorodifluoromethane (Freon-12)	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Ethylbenzene	4.8 U	4.8 U	5.3 U	5 U	1 J	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Methyl acetate	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Methylcyclohexane	1.2 J	1.5 J	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Methylene chloride	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Methyl-tert-butyl ether (MTBE)	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Styrene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Tetrachloroethene	4.8 U	3.2 J	5.3 U	140	4.3 U	3.4 J	8.2	2.1 J	5.9	3.1 J	6.1
Toluene	9.4	5.4	1.6 J	2 J	3.1 J	4.3 U	6.9	4.4 U	3.4 J	4.8 U	4.8 U
trans-1,2-Dichloroethene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
trans-1,3-Dichloropropene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Trichloroethene	4.8 U	4.8 U	5.3 U	7.4	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Trichlorofluoromethane(Freon-11)	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Vinyl chloride	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Xylene, total	4.8 U	4.8 U	3.1 J	4.8 J	7.2	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Wet Chemistry (%)											
% Solids	87.8	89.8	89.5	91	90.2	84.6	93.6	90.6	92.8	88.7	82.5
TOC	4,200	NA	NA	91 J	1,400	NA	NA	220	NA	NA	NA

CTO-100
SWMU360 Camp Lejeune
December 2005 and January 2006 Validated GW Raw Data

Sample ID	SWMU360-GW37-22-26	SWMU360-GW37-38-42	SWMU360-GW38-22-26	SWMU360-GW38-P-22-26	SWMU360-GW39-22-26	SWMU360-GW39-38-42	SWMU360-GW40-22-26	SWMU360-GW40-38-42	SWMU360-GW41-22-26	SWMU360-GW42-22-26	SWMU360-GW43-22-26	SWMU360-GW44-22-26
Sample Date	12/14/05	12/14/05	12/15/05	12/15/05	12/15/05	12/15/05	12/15/05	12/15/05	12/14/05	12/14/05	12/15/05	12/15/05
Chemical Name												
Volatile Organic Compounds (UG/L)												
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	0.72 J	5 U	5 U	5 U	5 U	5 U	0.56 J	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	0.97 J	5 U	5 U	5 U	5 U	5 U	0.58 J	5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	1.9 J	4.9 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Benzene	0.2 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon disulfide	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U	5 U	5 U	5 U	0.32 J	5 U	5 U	8.5	0.61 J	1.8 J
Chloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	120	5.8	1.2 J	1.3 J	0.84 J	0.43 J	24	9.5	1.5 J	0.67 J	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cumene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dichlorodifluoromethane (Freon-12)	5 U	5 U	5 U	5 U	5 U	1.9 J	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	1 J	0.41 J	1.3 J	0.78 J	1.3 J	0.47 J	1 J	0.42 J	5 U	5 U	5 U	5 U
Methyl acetate	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylcyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl-tert-butyl ether (MTBE)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	180	0.83 J	5 U	5 U	5 U	5 U	11	4 J	1.4 J	5 U	0.81 J	3.4 J
Toluene	0.51 J	5 U	0.53 J	0.4 J	0.57 J	0.32 J	0.42 J	0.3 J	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	1.4 J	0.43 J	5 U	5 U	5 U	5 U	0.52 J	0.4 J	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	54	0.94 J	0.59 J	0.58 J	0.38 J	5 U	5.6	2.4 J	5 U	5 U	0.35 J	5 U
Trichlorofluoromethane(Freon-11)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	0.51 J	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Xylene, total	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

Notes:
U- Analyte not detected
J- Reported value is estimated

CTO-100
SWMU360 Camp Lejeune
December 2005 and January 2006 Validated GW Raw Data

Sample ID	SWMU360-GW44-38-42	SWMU360-GW44-P-38-42	SWMU360-MW01	SWMU360-MW01IW	SWMU360-MW02	SWMU360-MW02IW	SWMU360-MW03	SWMU360-MW03IW	SWMU360-MW04	SWMU360-MW05	SWMU360-MW06	SWMU360-MW07	SWMU360-MW08	SWMU360-MW09
Sample Date	12/15/05	12/15/05	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06	1/18/06
Chemical Name														
Volatile Organic Compounds (UG/L)														
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	0.63 J	5 U	0.39 J	0.44 J	5 U	5 U	0.53 J	5 U	5 U	5 U	0.57 J	5 U
1,1-Dichloroethene	5 U	5 U	0.6 J	5 U	0.69 J	0.86 J	5 U	5 U	0.67 J	5 U	5 U	5 U	0.86 J	5 U
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.2 J	5 U	5 U	5 U	5 U	5 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	4.6 J	20 U	1.5 J	20 U	20 U	20 U
Benzene	0.44 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon disulfide	5 U	0.38 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	0.3 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.84 J	5 U	5 U	0.98 J
Chloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	5 U	5 U	28	5 U	28	31	1.6 J	5 U	25	5 U	5 U	3.9 J	30	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cumene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dichlorodifluoromethane (Freon-12)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.2 J	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	0.3 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl acetate	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylcyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl-tert-butyl ether (MTBE)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	100	5.2	0.46 J	5 U	5 U	5 U	13	5 U	5 U	5 U	5 U	5 U
Toluene	0.54 J	0.2 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	0.57 J	5 U	0.67 J	0.75 J	5 U	5 U	0.55 J	5 U	5 U	5 U	0.68 J	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5 U	5 U	7.1	5 U	4.6 J	4.7 J	0.52 J	5 U	4.6 J	5 U	5 U	0.83 J	3.5 J	0.44 J
Trichlorofluoromethane(Freon-11)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	2 U	2 U	2 U	2 U	2 U	0.58 J	2 U	2 U	2 U	2 U	2 U	2 U	2.8	2 U
Xylene, total	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

Notes:
U- Analyte not detected
J- Reported value is estimated

CTO-100
SWMU360 Camp Lejeune
December 2005 and January 2006 Validated GW Raw Data

Sample ID	SWMU360-MW09IW	SWMU360-MW10	SWMU360-MW10IW	SWMU360-MW10-P	SWMU360-MW11	SWMU360-MW12	1817-MW01	1817-MW01-P	IR78-GW39-06A
Sample Date	1/18/06	1/18/06	1/18/06	1/18/06	1/19/06	1/19/06	1/19/06	1/19/06	1/19/06
Chemical Name									
Volatile Organic Compounds (UG/L)									
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dibromo-3-chloropropane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dibromoethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,3-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
1,4-Dichlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	500 U	500 U	10 U
Acetone	12 J	20 U	20 U	20 U	20 U	1.9 J	1000 U	1000 U	20 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U	13 J	250 U	5 U
Bromodichloromethane	0.34 J	0.5 J	0.35 J	0.54 J	5 U	0.34 J	250 U	250 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Bromomethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Carbon disulfide	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Carbon tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Chloroethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Chloroform	3.7 J	1.5 J	1.6 J	1.7 J	5 U	1 J	250 U	250 U	5 U
Chloromethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
cis-1,2-Dichloroethene	5 U	14	16	13	1.2 J	16	370	360	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Cumene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Cyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Dichlorodifluoromethane (Freon-12)	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Methyl acetate	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Methylcyclohexane	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Methyl-tert-butyl ether (MTBE)	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Tetrachloroethene	5 U	9	9.3	8.8	5 U	12	3,100	3,200	0.69 J
Toluene	1.2 J	5 U	0.28 J	5 U	5 U	0.21 J	250 U	250 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	0.56 J	5 U	5 U	5 U	250 U	250 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Trichloroethene	5 U	3.2 J	3.3 J	3 J	0.4 J	4.1 J	200 J	190 J	5 U
Trichlorofluoromethane(Freon-11)	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U
Vinyl chloride	2 U	2 U	2 U	2 U	2 U	2 U	100 U	100 U	2 U
Xylene, total	5 U	5 U	5 U	5 U	5 U	5 U	250 U	250 U	5 U

Notes:
U- Analyte not detected
J- Reported value is estimated

CTO-100
MCB Camp Lejeune SWMU360
Validated Soil Raw Data
December 2005

Sample ID	SWMU360-IS34-1-3	SWMU360-IS34-16-18	SWMU360-IS35-1-3	SWMU360-IS35-14-16	SWMU360-IS36-1-3	SWMU360-IS36-17-19	SWMU360-IS37-1-3	SWMU360-IS37-17-19	SWMU360-IS37-P-1-3	SWMU360-IS45-1-3	SWMU360-IS45-17-19
Sample Date	12/13/05	12/13/05	12/13/05	12/13/05	12/14/05	12/14/05	12/14/05	12/14/05	12/14/05	12/13/05	12/13/05
Chemical Name											
Volatile Organic Compounds (UG/KG)											
1,1,1-Trichloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1,2,2-Tetrachloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-1	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1,2-Trichloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1-Dichloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,1-Dichloroethene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2,4-Trichlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dibromo-3-chloropropane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dibromoethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dichlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dichloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,2-Dichloropropane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,3-Dichlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
1,4-Dichlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
2-Butanone	9.6 U	9.6 U	11 U	9.9 U	8.6 U	8.6 U	8.8 U	8.9 U	8.5 U	9.5 U	9.6 U
2-Hexanone	9.6 U	9.6 U	11 U	9.9 U	8.6 U	8.6 U	8.8 U	8.9 U	8.5 U	9.5 U	9.6 U
4-Methyl-2-pentanone	9.6 U	9.6 U	11 U	9.9 U	8.6 U	8.6 U	8.8 U	8.9 U	8.5 U	9.5 U	9.6 U
Acetone	21	8.5 J	21 U	20 U	17 U	17 U	18 U	18 U	17 U	19 U	19 U
Benzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Bromodichloromethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Bromoform	4.8 U	4.8 U	5.3 U	5 U	4.3 U	0.6 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Bromomethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Carbon disulfide	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Carbon tetrachloride	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Chlorobenzene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Chloroethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Chloroform	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Chloromethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
cis-1,2-Dichloroethene	6.7	4.8 U	5.3 U	17	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
cis-1,3-Dichloropropene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Cumene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Cyclohexane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Dibromochloromethane	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Dichlorodifluoromethane (Freon-12)	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Ethylbenzene	4.8 U	4.8 U	5.3 U	5 U	1 J	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Methyl acetate	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Methylcyclohexane	1.2 J	1.5 J	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Methylene chloride	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Methyl-tert-butyl ether (MTBE)	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Styrene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Tetrachloroethene	4.8 U	3.2 J	5.3 U	140	4.3 U	3.4 J	8.2	2.1 J	5.9	3.1 J	6.1
Toluene	9.4	5.4	1.6 J	2 J	3.1 J	4.3 U	6.9	4.4 U	3.4 J	4.8 U	4.8 U
trans-1,2-Dichloroethene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
trans-1,3-Dichloropropene	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Trichloroethene	4.8 U	4.8 U	5.3 U	7.4	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Trichlorofluoromethane(Freon-11)	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Vinyl chloride	4.8 U	4.8 U	5.3 U	5 U	4.3 U	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Xylene, total	4.8 U	4.8 U	3.1 J	4.8 J	7.2	4.3 U	4.4 U	4.4 U	4.3 U	4.8 U	4.8 U
Wet Chemistry (%)											
% Solids	87.8	89.8	89.5	91	90.2	84.6	93.6	90.6	92.8	88.7	82.5
TOC	4,200	NA	NA	91 J	1,400	NA	NA	220	NA	NA	NA

Appendix C

Boring Logs and Well Construction Diagrams

CH2MHILL

PROJECT NUMBER: 330653.FI.SG | BORING NUMBER: SWMU-IS-34 Sheet: 1 of 1

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation LOCATION: MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ DRILLING CONTRACTOR: Columbia Technologies

DRILLING METHOD AND EQUIPMENT: Geoprobe DPT

WATER LEVELS: _____ START: 12/13/05 1520 FINISH: 12/13/05 1600 LOGGER: James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					Ground Surface	
					Sand, Tan-brown, gravelly, loose to medium dense, moist	PID/FID 9.22/21.20
					Silty Sand, Brown, fine, trace clay, medium dense, moist	3.69/53.80
5					Silty Clay, Gray, plasticity, moist, odor	4.30/40.47
					Sand, Tan, fine, loose, damp to moist	
					Sandy Silt, Brown, medium dense, moist	1.57/10.06
					Silty Sand, Brown, fine, medium dense, moist	1.95/0.29
10					Sandy Silt, Orange-brown, medium stiff, moist	2.16/2.43
					Sand, Tan-white, fine, loose, moist	2.90/6.81
					Silty Sand, Orange-tan, fine, medium dense, moist	2.86/3.74
15					Sand, Tan-white, fine, medium dense, moist, wet at bottom	2.71/4.51
						2.71/3.81
20					End of Boring at 20.0'	
25						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG	BORING NUMBER: SWMU-IS-35 Sheet: 1 of 1

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation **LOCATION:** MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ **DRILLING CONTRACTOR:** Columbia Technologies

DRILLING METHOD AND EQUIPMENT: Geoprobe DPT

WATER LEVELS: _____ **START:** 12/13/05 1610 **FINISH:** 13/13/05 1710 **LOGGER:** James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					Ground Surface	
0					Sand, Tan-white, fine, medium dense, moist	PID/FID 3.45/22.05
						6.26/31.08
5					Silty Sand, Brown, fine, medium dense, moist	13.34/21.98
						16.25/9.03
					Silty Sand, Orange-brown, fine to medium, medium dense, damp to moist	44.83/35.61
10						51.01/28.20
						73.17/41.62
15					Sand, Tan-white, fine, loose, moist	62.81/37.34
						No recovery Geoprobe shorten out
20					End of Boring at 20.0'	
25						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG | BORING NUMBER: SWMU-IS-36 Sheet: 1 of 1

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation LOCATION: MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ DRILLING CONTRACTOR: Columbia Technologies

DRILLING METHOD AND EQUIPMENT: Geoprobe DPT

WATER LEVELS: _____ START: 12/14/05 1155 FINISH: 12/14/05 1310 LOGGER: James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					Ground Surface	
0					Silty Sand, Brown-slight orange, medium dense, moist	PID/FID 32/1.85
5					Sand, Light red-white, fine, loose, moist	5.12/2.01
					Tan-white, fine, loose, moist	4.88/1.79
						5.12/2.13
10					Silty Sand, Tan-orange, trace clay, medium dense, moist	5.35/2.21
					Silty Clay, Gray, stiff, moist	6.34/2.01
						5.46/1.89
15						4.73/2.05
					Sand, Tan-orange, fine to medium, medium dense, moist, wet at bottom	14.59/2.11
20					End of Boring at 20.0'	
25						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG	BORING NUMBER: SWMU-IS-37 Sheet: 1 of 1

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation **LOCATION:** MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ **DRILLING CONTRACTOR:** Columbia Technologies

DRILLING METHOD AND EQUIPMENT: Geoprobe DPT

WATER LEVELS: _____ **START:** 12/14/05 0810 **FINISH:** 12/14/05 1025 **LOGGER:** James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					Ground Surface	
0					Same as previous Silty Sand (SM), Brown, medium dense, dry to damp	PID/FID 1.32/3.41
5					Light brown, orange-tan, medium dense, moist	14.26/4.29
					Sand (SW), Tan-white, fine, loose, moist	24.60/3.87
					Tan-orange, fine to medium, medium dense, moist	
10						28.75/4.29
					Tan-white, fine, loose, moist	31.24/6.28
					Same as previous	32.47/3.77
15					Same as previous	34.48/4.11
					Silty Sand (SM), Orange, fine, medium dense, moist	36.67/5.91
					Clay (CL), Gray, stiff, moist	
20					End of Boring at 20.0'	
25						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG | BORING NUMBER: SWMU-IS-45 Sheet: 1 of 1

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation LOCATION: MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ DRILLING CONTRACTOR: Columbia Technologies

DRILLING METHOD AND EQUIPMENT: Geoprobe DPT

WATER LEVELS: _____ START: 12/13/05 0900 FINISH: 12/13/05 0955 LOGGER: James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
0					Ground Surface	
					Silty Sand, Light brown, pebbles gravel, loose, dry	PID/FID
					Sandy Silt, Light gray-tan, orange, medium dense, moist	3.15/2.90
					Silty Sand, Tan-orange, medium dense, moist	4.08/1.91
5					Sand, Tan-white, fine, medium dense, moist	2.55/0.86
						2.19/1.53
						3.83/2.57
10					Sandy Clayey Silt, Orange, little plasticity, moist	
					Silty Clay, Gray to dark gray, stiff, moist	4.62/1.05
						5.33/3.87
15					Silty Clay, Orange-gray, stiff, moist	5.15/2.39
					Gray to dark gray, stiff, moist	
					Sand, Tan, fine to medium, medium dense, moist	4.72/3.34
					Silt, Dark orange-gray, organics, medium dense	
					Sand, Orange-tan, fine to medium with rock fragment (peeble), moist to wet	5.62/2.41
20					End of Boring at 20.0'	
25						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG	BORING NUMBER: SWMU-MW-09 Sheet: 1 of 2

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation **LOCATION:** MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ **DRILLING CONTRACTOR:** Parratt - Wolff

DRILLING METHOD AND EQUIPMENT: HSA 4.25" ID/MUD Rotary

WATER LEVELS: _____ **START:** 1/10/06 0810 **FINISH:** 01/12/06 1315 **LOGGER:** James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					Ground Surface	
0					Sand (SW), Light brown, fine to medium, little silt, loose, dry	PID/FID 3.51/1.89
					Orange-tan, fine, trace silt, medium dense, damp	2.81/1.77
5						
10					Light Brown, tan, fine, medium dense, damp to moist	4.05/2.32
					Light tan to light gray, little silt, medium dense, moist to wet	1.31/1.66
15						
20					Light tan to light gray, fine to medium, no silt, medium dense, wet	2.05/0.98
					Same as above	3.29/1.41
25						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG	BORING NUMBER: SWMU-MW-09 Sheet: 2 of 2

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation LOCATION: MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ DRILLING CONTRACTOR: Parratt - Wolff

DRILLING METHOD AND EQUIPMENT: HSA 4.25" ID/MUD Rotary

WATER LEVELS: _____ START: 1/10/06 0810 FINISH: 01/12/06 1315 LOGGER: James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30					Tan to yellow, fine to medium cemented, shells, wett	2.62/0.76
					Tan to light orange, fine to medium, medium dense, wet	3.88/2.93
35						
40					Light gray to tan, fine to medium, medium dense, wet to saturated	2.19/3.84
45					End of Boring at 45.0'	
50						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG	BORING NUMBER: SWMU-MW-10 Sheet: 1 of 2

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation **LOCATION:** MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ **DRILLING CONTRACTOR:** Parratt - Wolff

DRILLING METHOD AND EQUIPMENT: HSA 4.25" ID/MUD Rotary

WATER LEVELS: _____ **START:** 1/9/06 1200 **FINISH:** 1/1/06 1730 **LOGGER:** James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					Ground Surface	
0					Silty Sand (SM), Medium brown to orange, medium dense, dry	PID/FID 5.32/1.83
					Sand (SW), Light tan-gray-white, fine, loose, damp	4.05/0.62
5						
10					Same	3.27/3.51
					Silty Sand (SM), Gray-orange, medium dense, moist	16.05/12.47
15						
20					Silty Sand (SW), Tan-orange, medium dense, wet	12.33/11.53
					Same	15.89/16.29
25						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG	BORING NUMBER: SWMU-MW-10 Sheet: 2 of 2

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation LOCATION: MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ DRILLING CONTRACTOR: Parratt - Wolff

DRILLING METHOD AND EQUIPMENT: HSA 4.25" ID/MUD Rotary

WATER LEVELS: _____ START: 1/9/06 1200 FINISH: 1/1/06 1730 LOGGER: James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
30					Same	5.79/4.34
					Same	4.09/4.68
35						
40					Same	3.25/2.86
45					End of Boring at 45.0'	
50						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG	BORING NUMBER: SWMU-MW-11 Sheet: 1 of 1

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation **LOCATION:** MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ **DRILLING CONTRACTOR:** Parratt - Wolff

DRILLING METHOD AND EQUIPMENT: HSA 4.25" ID/MUD Rotary

WATER LEVELS: _____ **START:** 1/11/06 1230 **FINISH:** 1/11/06 1505 **LOGGER:** James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					Ground Surface	
0					Silty Sand (SM), Medium brown, fine, medium dense, damp	PID/FID 3.05/1.62
5					Light brown-orange, medium dense, damp	4.15/4.81
10					Tan-orange, trace clay, medium dense, damp	5.82/3.61
15					Silty Clay (CL), Gray-dark, stiff, moist	6.22/4.84
20					Sand (SW), Tan-orange, fine to medium, shells, wet	6.57/5.37
25					Same	12.21/9.74
					End of Boring at 27.0'	
30						

CH2MHILL

PROJECT NUMBER: 330653.FI.SG

BORING NUMBER: SWMU-MW-12
Sheet: 1 of 1

SOIL BORING LOG

PROJECT: SWMU 360 Well Installation LOCATION: MCB Camp Lejeune Jacksonville, NC

ELEVATION: _____ DRILLING CONTRACTOR: Parratt - Wolff

DRILLING METHOD AND EQUIPMENT: HSA 4.25" ID/MUD Rotary

WATER LEVELS: _____ START: 1/11/06 0905 FINISH: 1/11/06 1150 LOGGER: James Frank

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS: 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
					Ground Surface	
0					Silty Sand (SM), Medium brown-orange, medium dense, damp Light tan-white, fine, loose, damp	PID/FID 3.61/2.84
5					Sand (SW), Tan, fine to medium, loose, dry	4.09/3.62
10						5.12/4.87
15					Same	4.22/3.16
20					Silty Sand (SM), Tan-orange, medium dense, wet	2.39/0.87
25					End of Boring at 25.0'	
30						

CH2MHILL

PROJECT NUMBER	WELL NUMBER		
330653.FI.SG	SWMU MW-09	SHEET 1	OF 1

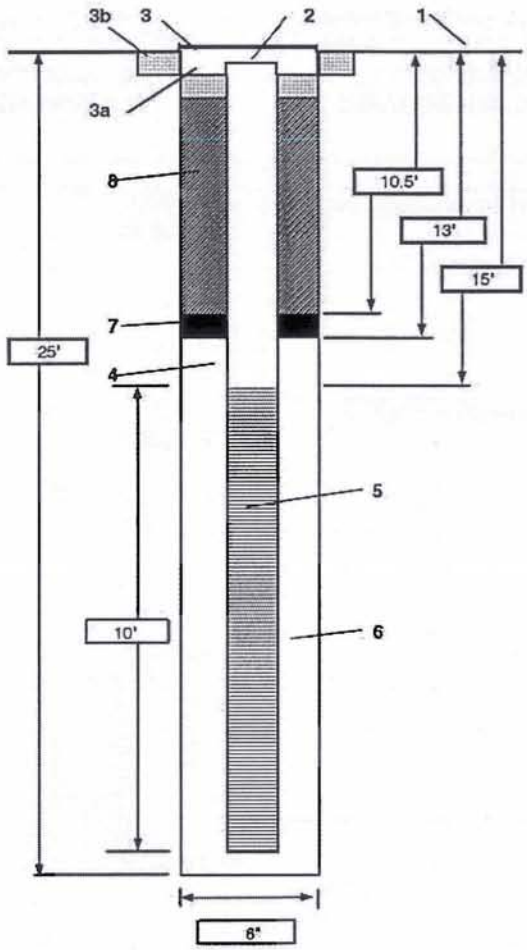
WELL COMPLETION DIAGRAM

PROJECT: SWMU 360 Well Installation — LOCATION: MCB Camp Lejeune, Jacksonville, AL

DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: HSA 4.25" ID

WATER LEVELS: — START: 1/10/06 1525 — END: 1/10/06 1738 — LOGGER: James Frank



1- Ground elevation at well

2- Top of casing elevation

3- Wellhead protection cover type: 8" diameter vault
- a) drain tube: No
- b) concrete pad dimensions: 2' X 2'

4- Dia./type of well casing: 2" Schedule 40 PVC

5- Type/slot size of screen: 10 ft. 0.010"

6- Type screen filter: #2 Sandpack
- a) Quantity used: 6 bags

7- Type of seal: Bentonite 3/8"
- a) Quantity used: 1 bag

8- Grout
- a) Grout mix used: Portland Type 1
- b) Method of placement: Tremie
- c) Vol. of well casing grout: 1.5 bags

Development method: Overpump/surge

Development time: 50 minutes

Estimated purge volume: 55 gallons

Comments

CH2MHILL

PROJECT NUMBER	WELL NUMBER		
330653.FI.SG	SWMU MW-09IW	SHEET 1	OF 1

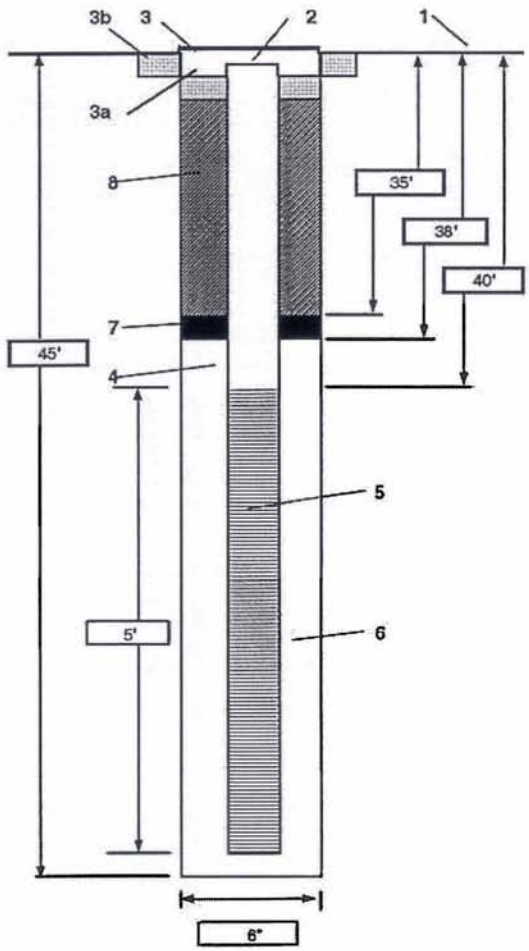
WELL COMPLETION DIAGRAM

PROJECT: SWMU 360 Well Installation — LOCATION: MCB Camp Lejeune, Jacksonville, AL

DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: HSA 4.25" ID/Mud Rotary

WATER LEVELS: — START: 1/10/06 0810 — END: 1/12/06 1315 — LOGGER: James Frank



1- Ground elevation at well	
2- Top of casing elevation	
3- Wellhead protection cover type	8" diameter vault
a) drain tube	No
b) concrete pad dimensions	2' X 2'
4- Dia./type of well casing	2" Schedule 40 PVC
5- Type/slot size of screen	5 ft. 0.010"
6- Type screen filter	#2 Sandpack
a) Quantity used	2 bags
7- Type of seal	Bentonite 3/8"
a) Quantity used	1.2 bags
8- Grout	
a) Grout mix used	Portland Type 1
b) Method of placement	Tremie
c) Vol. of well casing grout	3 bags
Development method	Overpump/surge
Development time	
Estimated purge volume	
Comments	Steel casing from 0 - 30' bgs, 6" ID

CH2MHILL

PROJECT NUMBER	WELL NUMBER
330653.FI.SG	SWMU 360-MW10 SHEET 1 OF 1

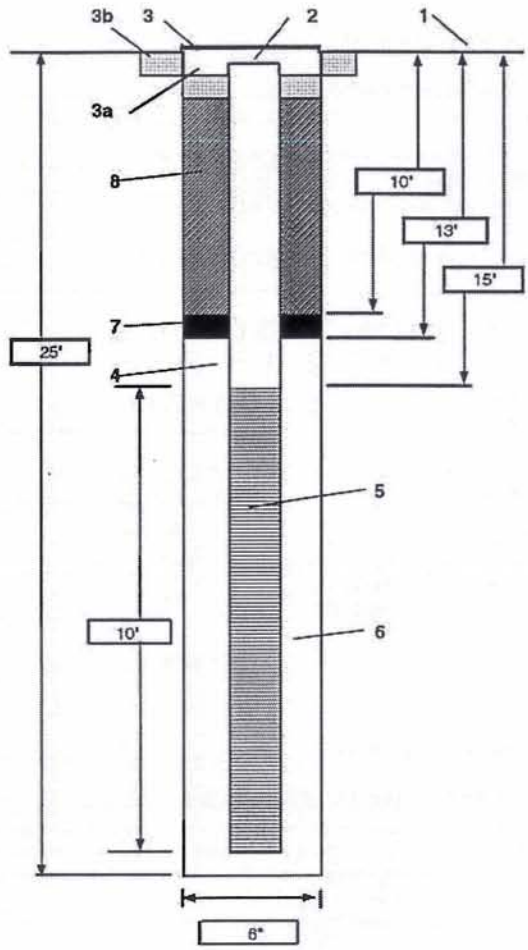
WELL COMPLETION DIAGRAM

PROJECT: SWMU 360 Well Installation LOCATION: MCB Camp Lejeune, Jacksonville, AL

DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: HSA 4.25" ID/Mud Rotary

WATER LEVELS: START: 1/10/06 1215 END: 1/10/06 1445 LOGGER: James Frank



1- Ground elevation at well

2- Top of casing elevation

3- Wellhead protection cover type: 8" diameter vault
- a) drain tube: No
- b) concrete pad dimensions: 2' X 2'

4- Dia./type of well casing: 2" Schedule 40 PVC

5- Type/slot size of screen: 5 ft. 0.010"

6- Type screen filter: #2 Sandpack
- a) Quantity used: 2 bags

7- Type of seal: Bentonite 3/8"
- a) Quantity used: 1 bag

8- Grout
- a) Grout mix used: Portland Type 1
- b) Method of placement: Tremie
- c) Vol. of well casing grout: 1.5 bags

Development method: Overpump/surge

Development time: 50 minutes

Estimated purge volume: 55 gallons

Comments

CH2MHILL

PROJECT NUMBER	WELL NUMBER		
330653.FI.SG	SWMU MW-10IW	SHEET 1	OF 1

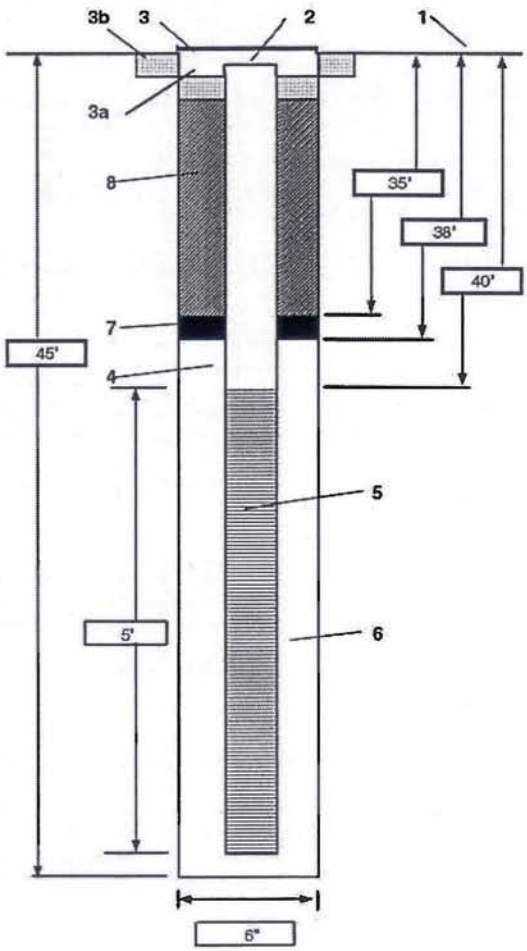
WELL COMPLETION DIAGRAM

PROJECT: SWMU 360 Well Installation — LOCATION: MCB Camp Lejeune, Jacksonville, AL

DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: HSA 4.25" ID/Mud Rotary

WATER LEVELS: — START: 1/9/06 1200 — END: 1/11/06 1730 — LOGGER: James Frank



1- Ground elevation at well

2- Top of casing elevation

3- Wellhead protection cover type: 8" diameter vault
- a) drain tube: No
- b) concrete pad dimensions: 2' X 2'

4- Dia./type of well casing: 2" Schedule 40 PVC

5- Type/slot size of screen: 5 ft. 0.010"

6- Type screen filter: #2 Sandpack
- a) Quantity used: 2.5 bags

7- Type of seal: Bentonite 3/8"
- a) Quantity used: 1 bag

8- Grout
- a) Grout mix used: Portland Type 1
- b) Method of placement: Tremie
- c) Vol. of well casing grout: 3 bags

Development method: Overpump/surge

Development time

Estimated purge volume

Comments: Steel casing from 0 - 30 ft. 6" ID

CH2MHILL

PROJECT NUMBER	WELL NUMBER	
330653.FI.SG	SWMU MW11	SHEET 1 OF 1

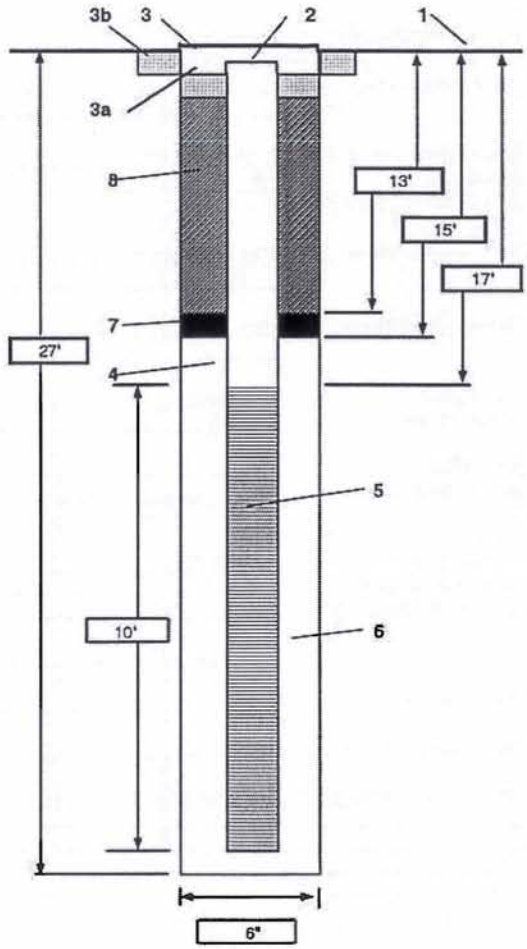
WELL COMPLETION DIAGRAM

PROJECT: SWMU 380 Well Installation LOCATION: MCB Camp Lejeune, Jacksonville, AL

DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: HSA 4.25" ID/Mud Rotary

WATER LEVELS: START: 1/11/06 1230 END: 1/11/06 1505 LOGGER: James Frank



1- Ground elevation at well

2- Top of casing elevation

3- Wellhead protection cover type: 8" diameter vault
- a) drain tube: J plug
- b) concrete pad dimensions: 2' X 2'

4- Dia./type of well casing: 2" Schedule 40 PVC

5- Type/slot size of screen: 10 ft. 0.010"

6- Type screen filter: #2 Sandpack
- a) Quantity used: 6 bags

7- Type of seal: Bentonite 3/8"
- a) Quantity used: 1 bag

8- Grout
- a) Grout mix used: Portland Type 1
- b) Method of placement: Tremie
- c) Vol. of well casing grout: 3 bags

Development method: Overpump/surge

Development time

Estimated purge volume

Comments

CH2MHILL

PROJECT NUMBER	WELL NUMBER		
330653.FI.SG	SWMU MW12	SHEET 1	OF 1

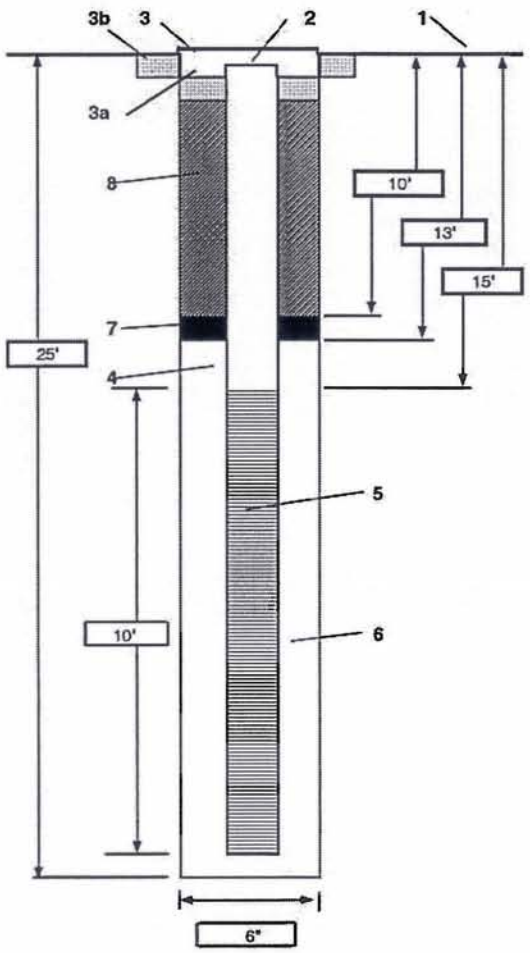
WELL COMPLETION DIAGRAM

PROJECT: SWMU 360 Well Installation — LOCATION: MCB Camp Lejeune, Jacksonville, AL

DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: HSA 4.25" ID/Mud Rotary

WATER LEVELS: — START: 1/11/06 0905 — END: 1/11/06 1150 — LOGGER: James Frank



1- Ground elevation at well

2- Top of casing elevation

3- Wellhead protection cover type: 8" diameter vault
- a) drain tube: J plug
- b) concrete pad dimensions: 2' X 2'

4- Dia./type of well casing: 2" Schedule 40 PVC

5- Type/slot size of screen: 10 ft. 0.010"

6- Type screen filter: #2 Sandpack
- a) Quantity used: 5 bags

7- Type of seal: Bentonite 3/8"
- a) Quantity used: 1 bag

8- Grout
- a) Grout mix used: Portland Type 1
- b) Method of placement: Tremie
- c) Vol. of well casing grout: 2 bags

Development method: Overpump/surge

Development time

Estimated purge volume

Comments

Appendix D

Groundwater Sampling Sheets from January 2006 Monitoring Well Sampling Event

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 360
Event:
Date: 1-19-06
Weather: Sunny 60's

Project Number: 338453.FT.SG
Well ID: 1817-MW01
Sample ID: ~~SWMU 60~~ 1817-MW01
Sampling Team: J. FRANK / RDM
M. WESTENDORP / CET

Total Depth: 25 FT.(BTOC)
Depth to water: (-) 19.48 FT.(BTOC)
Water Column: 5.68 FT.
(x) 0.163 GAL/FT.
Well Volume: 0.91 GAL.
Total Purge Vol.: 2.74 GAL.

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / HERON
Date and Time: 1-19-06 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 / Time: 1220	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: Low flow								

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1150	1	21.13	1.00	3.47	6.17	111	15.4	19.65	CLEAR
1200	2	21.23	1.01	1.81	6.18	112	8.9	19.60	CLEAR
1210	3	21.28	1.02	1.34	6.19	102	5.3	19.59	CLEAR
1220	4	21.44	1.00	1.51	6.15	109	4.5	19.60	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	40 ML VIAL 4°C	3

Observations/Notes:

TUBING SET @ 2 ft ABOVE BOTTOM

MS/MSD — Duplicate ID No.: 1817-MW01-P

Signature(s): James E Frank 1-19-06

RDM 4

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC Atlantic
Location: SWMU 360
Event: " "
Date: 1-19-06
Weather: clear cool 45°F

Project Number: 330653.FI.5G
Well ID: SWMU360-MW01
Sample ID: " "
Sampling Team: JF / MW

Total Depth: 28.00 FT.(BTOC)
Depth to water: (-) 21.19 FT.(BTOC)
Water Column: 6.81 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.110 GAL. X3
Total Purge Vol.: 3.330 GAL.

Purge Device: peristaltic

Measuring Device: Heron Dipper T
Date and Time: 1-18-06 / 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 Time: 0930	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: 0.10gpm	21.46	0.623	0.26	7.74	84	20.5	21.19	clear

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
0900	—	21.30	0.612	1.68	7.80	123	44.2	21.19	clear
0910	1	21.65	0.620	0.28	7.72	108	22.7	21.19	clear
0920	2	21.45	0.621	0.20	7.77	88	29.4	21.19	clear
0930	3	21.46	0.623	0.26	7.74	84	20.5	21.19	clear

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCL	40 ml Vial	3

Observations/Notes:

Tubing set @ 26'
Drawdown = 0

MS/MSD | Duplicate ID No.:

Signature(s): James E Frank 1-19-06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU360
Event:
Date: 1-19-06
Weather: SUNNY 50

Project Number: 330653.FI.SG
Well ID: SWMU360-MW01IW
Sample ID: SWMU360-MW01IW
Sampling Team: TFRANK / RDH
MWESTENDORF / CLT

Total Depth: 45 FT.(BTOC)
Depth to water: (-) 21.35 FT.(BTOC)
Water Column: 23.65 FT.
(x) 0.163 GAL/FT.
Well Volume: 3.85 GAL.
Total Purge Vol.: 11.56 GAL.

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / HORIBA
Date and Time: 1-18-06 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 / Time: 0945	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: Low flow	20.94	0.322	0.00	8.21	-145	15.7	21.46	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
0855	0	21.00	0.407	2.95	8.09	-83	37.9	21.95	CLEAR
0900	1	20.95	0.361	0.67	8.16	-106	36.8	21.44	CLEAR
0910	2	20.94	0.346	0.42	8.19	-116	11.2	21.51	CLEAR
0920	3	20.96	0.324	0.00	8.24	-147	12.4	21.49	CLEAR
0930	4	20.93	0.321	0.00	8.25	-151	6.5	21.45	CLEAR
0940	5	20.94	0.322	0.00	8.21	-145	15.7	21.46	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	40 mL 4°C	3

Observations/Notes:

TUBING DEPTH SET @ 3 ft ABOVE BOTTOM

MS/MSD
Duplicate ID No.:
Signature(s): Janice E. Franz 1-19-06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 360
Event: " "
Date: 1-19-06
Weather: Clear 50°F

Project Number: 330653.FI.SG
Well ID: SWMU 360-MW02
Sample ID: " "
Sampling Team: JF / MW

Total Depth: 26.85 FT.(BTOC)
Depth to water: (-) 19.90 FT.(BTOC)
Water Column: 6.95 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.132 GAL. x3
Total Purge Vol.: 3.398 GAL.

Purge Device: peristaltic

Measuring Device: Heron Dipper-T
Date and Time: 1-18-06 / 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 Time: 1035	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: 0.10 gpm	20.32	0.534	0.52	7.35	109	27.7	20.00	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1005	—	20.12	0.528	3.27	7.52	135	57.4	19.90	clear
1015	1	20.46	0.532	0.80	7.38	126	84.7	20.00	clear
1025	2	20.26	0.533	0.49	7.35	116	34.5	20.00	clear
1035	3	20.32	0.534	0.52	7.35	109	27.7	20.00	clear

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCL	40 ml Vial	3

Observations/Notes:

Tubing set @ 24'
Drawdown = .10'

MS/MSD
Duplicate ID No.:
Signature(s): Matt B. Westendorf

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 360
Event:
Date: 1-19-06
Weather: Sunny 50's

Project Number: 330652.FI.SG
Well ID: SWMU 360-MW02IW
Sample ID: SWMU 360-MW02IW
Sampling Team: J FRANK / RDM
M. WESTENDORF / CLT

Total Depth: 45 FT.(BTOC)
Depth to water: (-) 21.90 FT.(BTOC)
Water Column: 23.10 FT.
(x) 0.163 GAL/FT.
Well Volume: 3.74 GAL.
Total Purge Vol.: 11.25 GAL.

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / HERON
Date and Time: 1-19-06 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 / Time: 1050	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: Low flow	20.14	0.600	0.16	7.76	81	8.2	21.98	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1000	1	20.06	0.599	0.31	7.76	90	62.7	22.01	CLEAR
1010	2	20.14	0.599	0.25	7.76	87	12.8	22.02	CLEAR
1020	3	20.15	0.601	0.21	7.75	81	41.3	22.00	CLEAR
1030	4	20.13	0.598	0.17	7.76	80	25.4	21.99	CLEAR
1040	5	20.15	0.600	0.16	7.76	78	9.6	22.00	CLEAR
1050	6	20.14	0.600	0.16	7.76	81	8.2	21.98	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	40 mL VIAL 4°C	3

Observations/Notes:

TUBING SET @ 3 ft ABOVE BOTTOM

MS/MSD | Duplicate ID No.:

Signature(s): James E Frank 1-19-06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 36Φ
Event:
Date: 1-19-Φ6
Weather: SUNNY 40-60

Project Number: 338653.FI.SG
Well ID: SWMU 36Φ-MWΦ3
Sample ID: SWMU 36-Φ-MWΦ3
Sampling Team: J FRANK / IZOH
M WESTENDORF / CLT

Total Depth: 3Φ FT.(BTOC)
Depth to water: (-) 18.98 FT.(BTOC)
Water Column: 11.ΦZ FT.
(x) Φ.163 GAL/FT.
Well Volume: 1.ΦΦ GAL.
Total Purge Vol.: 5.39 GAL.

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / HERON
Date and Time: 1-19-Φ6 / 16ΦΦ

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	~~0.163~~
4	0.653

SAMPLE DATA

Date: 1-19-Φ6 / Time: ΦΦ25	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DIW	Color / Odor / Comments
Method: Low flow	21.56	Φ.635	Φ.15	7.79	35	18.Φ	19.Φ6	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DIW	Color / Odor / Comments
Φ745	1	21.71	Φ.652	3.65	7.87	41	85.Φ	19.ΦΦ	CLEAR
Φ755	2	21.64	Φ.637	3.25	7.91	34	31.Φ	19.Φ5	CLEAR
Φ8Φ5	3	21.55	Φ.633	2.13	7.95	33	20.Φ	19.Φ5	CLEAR
Φ815	4	21.57	Φ.638	Φ.25	7.78	31	21.Φ	19.Φ6	CLEAR
Φ825	5	21.56	Φ.635	Φ.15	7.79	35	18.Φ	19.Φ6	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	40 mL 4°C	3

Observations/Notes:

TUBING SET @ 2 ft ABOVE BOTTOM

MS/MSD | Duplicate ID No.:

Signature(s): James S Frank 1-19-Φ6

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC Atlantic
Location: SWMU 360
Event: " "
Date: 1-19-06
Weather: clear cool 40°F

Project Number: 330653.FI.SG
Well ID: SWMU36Q-MW03IW
Sample ID: " "
Sampling Team: JF - MW

Total Depth: 44.00 FT.(BTOC)
Depth to water: (-) 19.02 FT.(BTOC)
Water Column: 24.98 FT.
(x) 0.163 GAL/FT.
Well Volume: 4.071 GAL. X3
Total Purge Vol.: 12.215 GAL.

Purge Device: peristaltic

Measuring Device: Heron Dipper T
Date and Time: 1-18-06 / 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 Time: 0840	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: ____	Color / Odor / Comments
Method: 0.10 gpm	21.17	0.300	0.03	8.50	-113	4.0	19.70	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
0745	—	19.60	0.292	1.72	8.69	35	19.1	19.02	
0755	1	19.92	0.292	1.50	8.65	31	11.1	19.20	
0805	2	20.81	0.295	0.64	8.55	-46	1.4	19.70	
0815	3	21.05	0.299	0.13	8.50	-60	5.6	19.70	
0820	~~3.5~~	21.15	0.300	0.09	8.47	-100	5.9	19.70	
0830	~~4.5~~	21.18	0.300	0.04	8.49	-109	4.7	19.70	
0840	~~5.5~~	21.17	0.300	0.03	8.50	-113	4.0	19.70	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCL	40 ml vials	3

Observations/Notes:

Tubing set @ 42'
Drawdown = .68'

MS/MSD | Duplicate ID No.:

Signature(s): Samuel E Franz 1-19-06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 360
Event: " "
Date: 1-19-06
Weather: Clear 60°F

Project Number: 330653.FI.SG
Well ID: SWMU 360 - MW04
Sample ID: " "
Sampling Team: JF - MW

Total Depth: 27.90 FT.(BTOC)
Depth to water: (-) 20.10 FT.(BTOC)
Water Column: 7.80 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.271 GAL. x 3
Total Purge Vol.: 3.814 GAL.
Purge Device: Peristaltic

Measuring Device: Heron Dipper T
Date and Time: 1-18-06 / 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2 (circled)	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 / Time: 1440	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: 0.10 gpm	21.00	0.567	0.11	7.74	109	16.6	20.15	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1400	—	21.37	0.568	1.82	7.82	116	197	20.10	Cloudy
1410	1	21.02	0.567	0.27	7.74	111	79.3	20.15	Clearing
1420	2	20.90	0.567	0.17	7.74	110	45.4	20.15	Clear
1430	3	20.90	0.566	0.15	7.74	109	17.5	20.15	
1440	4	21.00	0.567	0.11	7.74	109	16.6	20.15	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCL	40 mL Vials	3

Observations/Notes:
Tubing set @ 25'
Drawdown = .05'

MS/MSD

Duplicate ID No.:

Signature(s): Matt [signature]

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 36Φ
Event:
Date: 1-19-Φ6
Weather: SUNNY 60Φs

Project Number: 33Φ653.FT.SG
Well ID: SWMU 36Φ-MWΦ5
Sample ID: SWMU 36Φ-MWΦ5
Sampling Team: J FRANK / RPH
M. WESTENDORF / CLT

Total Depth: 24.5Φ FT.(BTOC)
Depth to water: (-) 16.64 FT.(BTOC)
Water Column: 7.86 FT.
(x) Φ.163 GAL/FT.
Well Volume: 1.28 GAL.
Total Purge Vol.: 3.84 GAL.

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / H2OLOW
Date and Time: 1-19-Φ6 16ΦΦ

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	(0.163)
4	0.653

SAMPLE DATA

Date: 1-19-Φ6 Time: 154Φ	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: Low flow	21.29	Φ.211	7.21	4.99	3Φ4	9.5	16.7Φ	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
15ΦΦ	1	2Φ.75	Φ.198	7.66	5.99	276	22.2	16.7Φ	CLEAR
151Φ	2	21.26	Φ.212	7.33	5.12	299	14.6	16.7Φ	CLEAR
152Φ	3	21.3Φ	Φ.21Φ	7.28	5.Φ5	3Φ6	9.8	16.7Φ	CLEAR
153Φ	4	21.3Φ	Φ.215	7.16	4.98	3Φ7	6.5	16.7Φ	CLEAR
154Φ	5	21.29	Φ.211	7.21	4.99	3Φ4	9.5	16.7Φ	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	4Φ ml VIALS 4°c	3

Observations/Notes:

TUBING SET @ 2' ABOVE BOTTOM

MS/MSD | Duplicate ID No.:

Signature(s): James E Frank 1-19-Φ6

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 36
Event: " "
Date: 1-19-06
Weather: Clear 63°F

Project Number: 330653, FF.SG
Well ID: SWMU 36-MW06
Sample ID: "
Sampling Team: JF - MW

Total Depth: 27.00 FT.(BTOC)
Depth to water: (-) 17.45 FT.(BTOC)
Water Column: FT.
(x) GAL/FT.
Well Volume: GAL.
Total Purge Vol.: GAL.

Purge Device: Peristaltic

Measuring Device: Heron Dipper T
Date and Time: 1-18-06 / 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 Time: 1540	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: 0.10 gpm								

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1510	—	21.43	0.152	7.72	7.10	184	37.3	17.45	
1520	1	21.46	0.143	7.62	6.43	208	34.1	17.71	
1530	2	21.44	0.144	7.60	6.37	217	26.5	17.71	
1540	3	21.48	0.149	7.57	6.36	220	14.3	17.71	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC OLM04			

Observations/Notes:
Tubing set @ 25'
Drawdown =

MS/MSD | Duplicate ID No.:

Signature(s):

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET 3 (50)

Client: NAVFAC
Location: SWMU 36Φ
Event:
Date: 1-19-Φ6
Weather: Sunny 60's

Project Number: 333Φ65ΦΦ. FT.SG
Well ID: SWMU36Φ-MWΦ7
Sample ID: SWMU36Φ-MWΦ7
Sampling Team: J FRANK / RDY
M. WESTENDORF / CLT

Total Depth: 24.5Φ FT.(BTOC)
Depth to water: (-) 18.99 FT.(BTOC)
Water Column: 5.56 FT.
(x) Φ.163 GAL/FT.
Well Volume: Φ.91 GAL.
Total Purge Vol.: 2.72 GAL.

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / HERON
Date and Time: 1-19-Φ6 16ΦΦ

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-Φ6 Time: 13:1Φ	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: Low flow	2Φ.55	Φ.6ΦΦ5	Φ.96	6.94	122	4.8	19.Φ5	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
124Φ	Φ	2Φ.46	Φ.61Φ	3.32	6.55	167	27.1	19.Φ6	CLEAR
125Φ	1	2Φ.5Φ	Φ.6ΦΦ6	1.26	6.84	147	8.7	19.Φ5	CLEAR
13ΦΦ	2	2Φ.59	Φ.6Φ3	1.1Φ	6.91	121	11.2	19.Φ5	CLEAR
131Φ	3	2Φ.55	Φ.6Φ5	Φ.96	6.94	122	4.8	19.Φ5	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	4Φ ml 4°C	3

Observations/Notes:

TUBING SET @ 2ft ABOVE BOTTOM

MS/MSD | Duplicate ID No.:

Signature(s): [signature] 1-19-Φ6

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 36Φ
Event:
Date: 1-19-Φ6
Weather: SUNNY / 60's

Project Number: 330653.FI.SG
Well ID: SWMU36Φ-MWΦ8
Sample ID: SWMU36Φ-MWΦ8
Sampling Team: J. FRANK / RDH
M. WESTENDORF / CLT

Total Depth: 25 ΦΦ FT.(BTOC)
Depth to water: (-) 18.85 FT.(BTOC)
Water Column: 6.15 FT.
(x) Φ.163 GAL/FT.
Well Volume: GAL.
Total Purge Vol.: GAL.

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / HERON
Date and Time: 1-18-Φ6 16ΦΦ

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-Φ6 / Time: 142Φ	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: LOW FLOW	21.23	Φ.679	1.12	6.77	142	8.4	18.91	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
134Φ	Φ	21.22	Φ.681	3.44	6.8Φ	172	1.7	18.91	CLEAR
135Φ	1	21.28	Φ.68Φ	2.13	6.8Φ	171	5.8	18.9Φ	CLEAR
14ΦΦ	2	21.35	Φ.679	1.38	6.78	165	1.9	18.9Φ	CLEAR
141Φ	3	21.32	Φ.678	1.16	6.77	144	8.3	18.92	CLEAR
142Φ	4	21.23	Φ.679	1.12	6.77	142	8.4	18.91	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	4ΦmL 4°C	3

Observations/Notes:

TUBING SET @ 2 ft ABOVE BOTTOM

MS/MSD | Duplicate ID No.:

Signature(s): James E Frank 1-19-Φ6

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC Atlantic
Location: ~~Site 88, Camp Lejeune, NC~~ SWMU 36Ø
Event: ~~CTO-105 Site 88 Sampling~~
Date: 1-18-Ø6
Weather: CLEAR 45

Project Number: ~~328432.FI.FQ.88~~ 334653.FI.SG
Well ID: SWMU 36Ø-MWØ9
Sample ID: SWMU 36Ø-MWØ9
Sampling Team: J FRANK / RDH

Total Depth: 25 FT.(BTOC)
Depth to water: (-) 14.84 FT.(BTOC)
Water Column: 1Ø.16 FT.
(x) 0.163 GAL/FT.
Well Volume: ~~1.66 lb. Std~~ GAL.
Total Purge Vol.: 4.97 GAL.

Purge Device: Geopump 2 Peristaltic Pump

Measuring Device: Water Level Meter
Date and Time: 1-18-Ø6 16ØØ

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	(0.163)
4	0.653

SAMPLE DATA

Date: 1-18-Ø6 / Time: 175Ø	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: Low Flow	22.ØØ	Ø.275	5.Ø5	7.Ø8	2Ø5	12.2	14.76	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1710	1	22.Ø6	Ø.285	5.88	7.32	185	4Ø.8	14.73	CLEAR
1720	2	22.Ø8	Ø.279	5.72	7.18	191	25.2	14.75	CLEAR
1730	3 (G)	22.13	Ø.274	5.25	7.28	198	19.4	14.75	CLEAR
1740	4	22.11	Ø.273	5.Ø7	7.12	2Ø4	16.Ø	14.75	CLEAR
1750	5	22.Ø9	Ø.275	5.Ø5	7.Ø8	2Ø5	12.2	14.76	CLEAR

Sample information: method, container number, size, and type, preservative used

Analysis	Preservative	Container requirements	No. of containers
VOCs ~~by OLC03.2~~	HCl	40 mL VOA	3
~~TOC~~	~~H2SO4~~	~~40 mL VOA~~	~~2~~
~~Methane/Ethane/Ethene~~ RSK175	~~HCl~~	~~40 mL VOA~~	~~2~~
Ferrous Iron/~~Ferric~~ Iron	~~HCl~~	~~125 mL~~	~~1~~
~~Total Iron~~	~~HNO3~~	~~250 mL~~	~~1~~
~~Alkalinity/Chloride/Nitrogen/Nitrate/Nitrite/SO4~~	~~None~~	~~250 mL~~	~~1~~
~~Sulfide~~	~~NaOH/ZnAc~~	~~1L~~	~~1~~

Observations/Notes:

MS/MSD | ~~Duplicate ID No.~~: SWMU 36Ø-MWØ9

Signature(s): James E. Frank 1-18-Ø6

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: ~~NAVFAC Atlantic~~
Location: ~~Site 88, Camp Lejeune, NC~~ SWMU 360
Event: ~~CTO-105 Site 88 Sampling~~
Date: 1-18-06
Weather: cold windy 45°F

Project Number: 328432.FI.FQ.88
Well ID: SWMU 360-MW 89IW
Sample ID: " "
Sampling Team: J. Frank M. Westendorf

Total Depth: 45.00 FT.(BTOC)
Depth to water: (-) 14.80 FT.(BTOC)
Water Column: 30.20 FT.
(x) 0.163 GAL/FT.
Well Volume: 4.92 GAL. x 3
Total Purge Vol.: 14.76 GAL.

Measuring Device: Water Level Meter
Date and Time: 1-18-06 / 1600

Purge Device: Geopump 2 Peristaltic Pump

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-18-06 Time: 1800	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: ~~Low Flow~~ 0.10 gpm	21.20	1.26	6.45	13.41	-127	16.5	14.94	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1710	—	21.23	1.29	6.83	13.31	39	12.3	14.80	Clear
1720	1	21.45	1.28	6.54	13.37	-100	48.2	14.90	" "
1730	2	21.47	1.28	6.49	13.38	-120	31.7	14.93	" "
1740	3	21.32	1.26	6.47	13.39	-122	20.6	14.94	" "
1750	4	21.28	1.26	6.46	13.40	-125	18.4	14.94	" "
1800	5	21.20	1.26	6.45	13.41	-127	16.5	14.94	Clear

Sample information: method, container number, size and type, preservative used

Analysis	Preservative	Container requirements	No. of containers
VOCs by ~~OLC03.2~~	HCl	40 mL VOA	3
~~TOC~~	~~H2SO4~~	~~40 mL VOA~~	~~2~~
~~Methane/Ethane/Ethene RSK175~~	~~HCl~~	~~40 mL VOA~~	~~2~~
~~Ferrous Iron/Ferric Iron~~	~~HCl~~	~~125 mL~~	~~1~~
~~Total Iron~~	~~HNO3~~	~~250 mL~~	~~1~~
~~Alkalinity/Chloride/Nitrogen/Nitrate/Nitrite/SO4~~	~~None~~	~~250 mL~~	~~1~~
~~Sulfide~~	NaOH/ZnAc	1 L	~~1~~

Observations/Notes:

MS/MSD | Duplicate ID No.:

Signature(s): James E Frank 1-18-06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC Atlantic
Location: ~~Site 88, Camp Lejeune, NC~~ SWMU 36Φ
Event: ~~CTO-105 Site 88 Sampling~~
Date: 1-18-06
Weather: DARK, COLD, WINDY

Project Number: ~~328432.FI.FQ.88~~ 33Φ653.FI.SG
Well ID: SWMU 36Φ-MW1Φ
Sample ID: SWMU 36Φ-MW1Φ
Sampling Team: J FRANK / RDH
M WESTENDORF / CLT

Total Depth: 25 FT.(BTOC)
Depth to water: (-) 19.32 FT.(BTOC)
Water Column: 5.68 FT.
(x) 0.163 GAL/FT.
Well Volume: Φ.93 GAL.
Total Purge Vol.: 2.78 GAL.

Purge Device: Geopump 2 Peristaltic Pump

Measuring Device: Water Level Meter
Date and Time: 1-18-06 1ΦΦΦ

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-18-06 Time: 1905	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: PTW	Color / Odor / Comments
Method: Low Flow	22.10	0.596	1.07	7.81	110	18.4	19.5Φ	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: PTW	Color / Odor / Comments
1820	Φ	21.97	0.599	4.62	10.42	103	104	19.45	CLEAR
1830	1	21.54	0.598	2.87	8.18	94	81.3	19.5Φ	CLEAR
1840	2	21.97	0.596	3.02	7.84	109	62.3	19.5Φ	CLEAR
1850	3	22.00	0.594	1.10	7.82	110	40.2	19.5Φ	CLEAR
1900	4	22.01	0.595	1.09	7.81	111	21.9	19.5Φ	CLEAR
1905	4.5	22.10	0.596	1.07	7.81	110	18.4	19.5Φ	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOCs by ~~OLC03.2~~	HCl	40 mL VOA	3
~~TOC~~	~~H2SO4~~	~~40 mL VOA~~	~~2~~
~~Methane/Ethane/Ethene~~ RSK175	~~HCl~~	~~40 mL VOA~~	~~2~~
~~Ferrous Iron/Ferric Iron~~	~~HCl~~	~~125 mL~~	~~1~~
Total Iron	~~HNO3~~	~~250 mL~~	1
Alkalinity/Chloride/Nitrogen/Nitrate/Nitrite/SO4	~~None~~	~~250 mL~~	~~1~~
~~Sulfide~~	~~NaOH/ZnAc~~	~~1L~~	~~1~~

Observations/Notes:

MS/MSD — Duplicate ID No.: SWMU 36Φ-MW1Φ-P

Signature(s): James E Frank 1-18-06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC Atlantic
Location: ~~Site 88, Camp Lejeune, NC~~ SWMU360
Event: ~~GTO 105 Site 88 Sampling~~
Date: 1-18-06
Weather: Dark, Cold, Windy 40°F

Project Number: ~~328432.FI.FQ.88~~
Well ID: SWMU360-MW18IW
Sample ID: " "
Sampling Team: J.F MW

Total Depth: 45.00 FT.(BTOC)
Depth to water: (-) 19.18 FT.(BTOC)
Water Column: 25.82 FT.
(x) 0.163 GAL/FT.
Well Volume: 4.20 GAL. X3
Total Purge Vol.: 7.20 GAL.

Purge Device: Geopump 2 Peristaltic Pump

Measuring Device: Water Level Meter
Date and Time: 1-18-06 / 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
(2)	0.163
4	0.653

SAMPLE DATA

Date: 1-18-06 Time: 1905	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: Low Flow	20.80	0.438	0.12	8.85	50	5.9	19.27	clear

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1820	—	21.04	0.422	1.53	10.04	41	18.9	19.18	clear
1830	1	20.84	0.415	0.17	9.71	20	47.9	19.25	
1840	2	20.63	6.434	0.14	8.92	69	6.4	19.27	
1850	3	20.70	0.435	0.13	8.86	60	5.0	19.27	clear
1900	4	20.75	0.438	0.13	8.85	59	5.3	19.27	
1905	4.5	20.80	0.438	0.12	8.85	50	5.9	19.27	clear

Sample information: method, container number, size, and type; preservative used

Analysis	Preservative	Container requirements	No. of containers
~~VOCs by OLC03.2~~	~~HCl~~	~~40 mL VOA~~	~~3~~
~~TOC~~	~~H2SO4~~	~~40 mL VOA~~	~~2~~
~~Methane/Ethane/Ethene RSK175~~	~~HCl~~	~~40 mL VOA~~	~~2~~
~~Ferrous Iron/Ferric Iron~~	~~HCl~~	~~125 mL~~	~~1~~
~~Total Iron~~	~~HNO3~~	~~250 mL~~	~~1~~
~~Alkalinity/Chloride/Nitrogen/Nitrate/Nitrite/SO4~~	~~None~~	~~250 mL~~	~~1~~
~~Sulfide~~	~~NaOH/ZnAc~~	~~1 L~~	~~1~~

~~Observations/Notes:~~

MS/MSD | Duplicate ID No.:

Signature(s): Laurence E Frank 1-18-06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 368
Event: " "
Date: 1-19-06
Weather: Clear 60°F

Project Number: 330653.FI.SG
Well ID: SWMU 368-MW11
Sample ID: " "
Sampling Team: MW - JF

Total Depth: 26.85 FT.(BTOC)
Depth to water: (-) 19.23 FT.(BTOC)
Water Column: 7.62 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.242 GAL. x3
Total Purge Vol.: 3.726 GAL.

Purge Device: peristaltic

Measuring Device: Heron Dipper T
Date and Time: 1-18-06 / 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
(2)	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 Time: 1340	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: 0.10 gpm	20.90	0.682	0.57	7.64	-21	73.8	19.23	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1310	~	21.05	0.668	0.80	7.60	6	84.4	19.23	Cloudy
1320	1	21.04	0.679	0.66	7.63	-12	116	19.23	Cloudy
1330	2	20.90	0.681	0.60	7.64	-17	121	19.23	Cloudy
1340	3	20.90	0.682	0.57	7.64	-21	73.8	19.23	Clearing

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers

Observations/Notes:

Tubing set @ 24'
Drawdown = 0

MS/MSD | Duplicate ID No.:

Signature(s): Matthew J. Westerhoff

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: SWMU 360
Event: " "
Date: 1-19-06
Weather: Clear 55°F

Project Number: 330653.FI.SG
Well ID: SWMU 360 - MW12
Sample ID: " "
Sampling Team: JF - MW

Total Depth: 25.00 FT.(BTOC)
Depth to water: (-) 16.50 FT.(BTOC)
Water Column: 8.50 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.385 GAL X3
Total Purge Vol.: 4.156 GAL.
Purge Device: peristaltic

Measuring Device: Heron Dipper-T
Date and Time: 1-18-06 / 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 / Time: 1135 (E) / Method: 0.10gpm	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other:	Color / Odor / Comments

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1055	~	21.69	0.559	1.41	7.66	89	51.1	16.50	Clear
1105	1	21.82	0.545	0.65	7.59	69	68.6	16.59	Clear
1115	2	21.88	0.545	0.49	7.58	55	61.4	16.60	Clear
1125	3	21.80	0.545	0.35	7.57	52	60.7	16.60	
1135	4	22.00	0.545	0.30	7.57	48	59.2	16.60	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers

Observations/Notes:
Tubing set @ 23'
Drawdown ≈ .10'

MS/MSD

Duplicate ID No.:

Signature(s): [signature]

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: ~~SWMU 360~~ IR78
Event: " SWMU 360 "
Date: 1-19-06
Weather: Clear 58°F

Project Number: 330653.FI.SG
Well ID: 78 GW 39
Sample ID: ~~#~~ IR78-GW39-06A
Sampling Team: JF / AW

Total Depth: 20.00 FT.(BTOC)
Depth to water: (-) 14.78 FT.(BTOC)
Water Column: 5.22 FT.
(x) 0.653 GAL/FT.
Well Volume: 3.40 GAL. x 3
Total Purge Vol.: 10.22 GAL.

Purge Device: peristaltic

Measuring Device: Heron Dipper T
Date and Time: 1-18-06 / 1600

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 1-19-06 / Time: 1245	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: 0.10 gpm	19.80	0.270	2.60	5.13	300	7.9	14.80	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1205	—	19.69	0.257	3.30	5.75	251	3.3	14.78	
1215	1	19.67	0.258	2.49	5.21	285	7.7	14.80	
1225	2	19.71	0.262	2.59	5.20	290	4.3	14.80	
1235	3	19.82	0.265	2.59	5.15	299	9.4	14.80	
1245	4	19.80	0.270	2.60	5.13	300	7.9	14.80	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCL	40 ml Vials	3

Observations/Notes:

Tubing set @ 18'
Drawdown = .02'

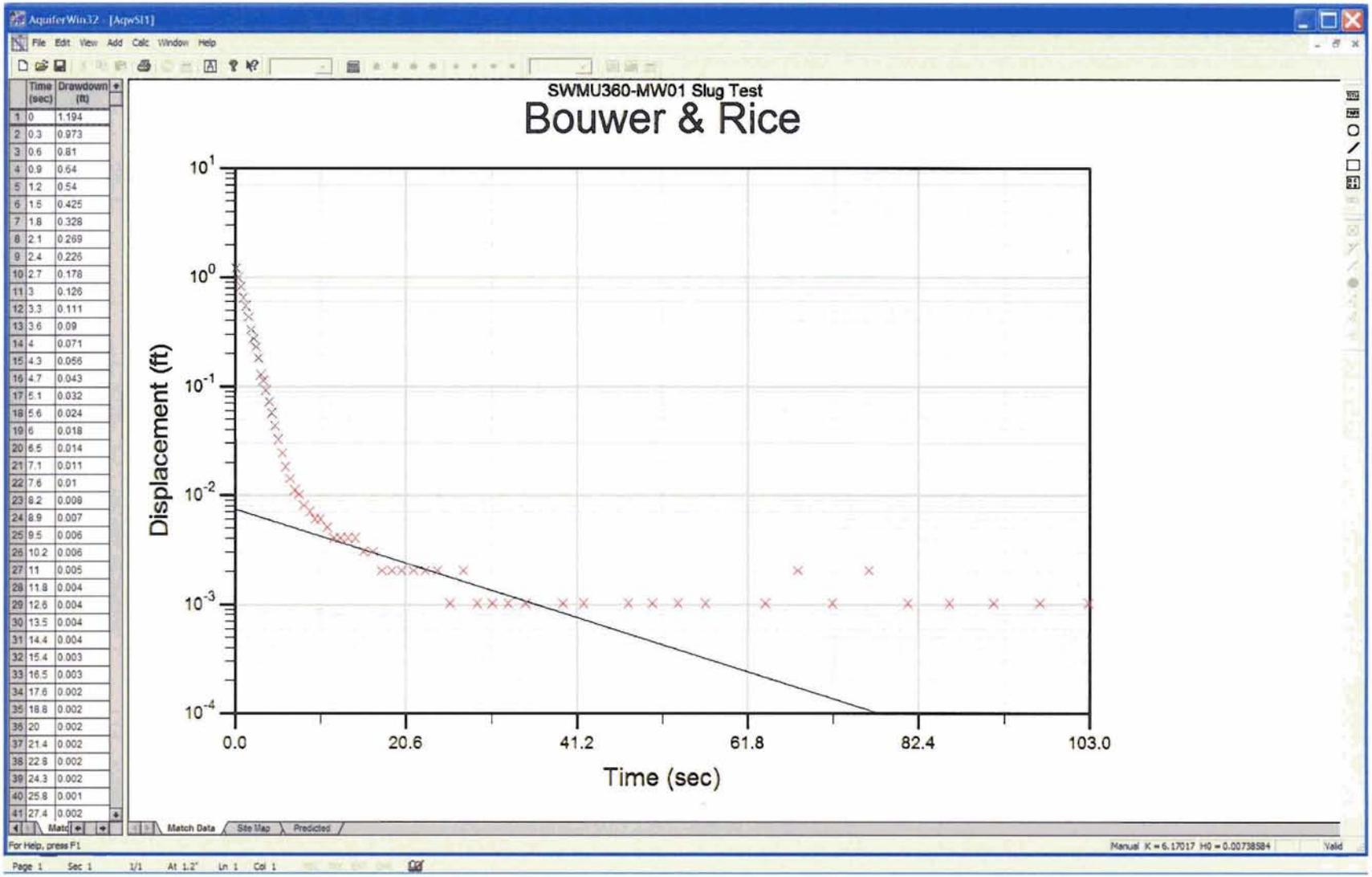
MS/MSD

Duplicate ID No.:

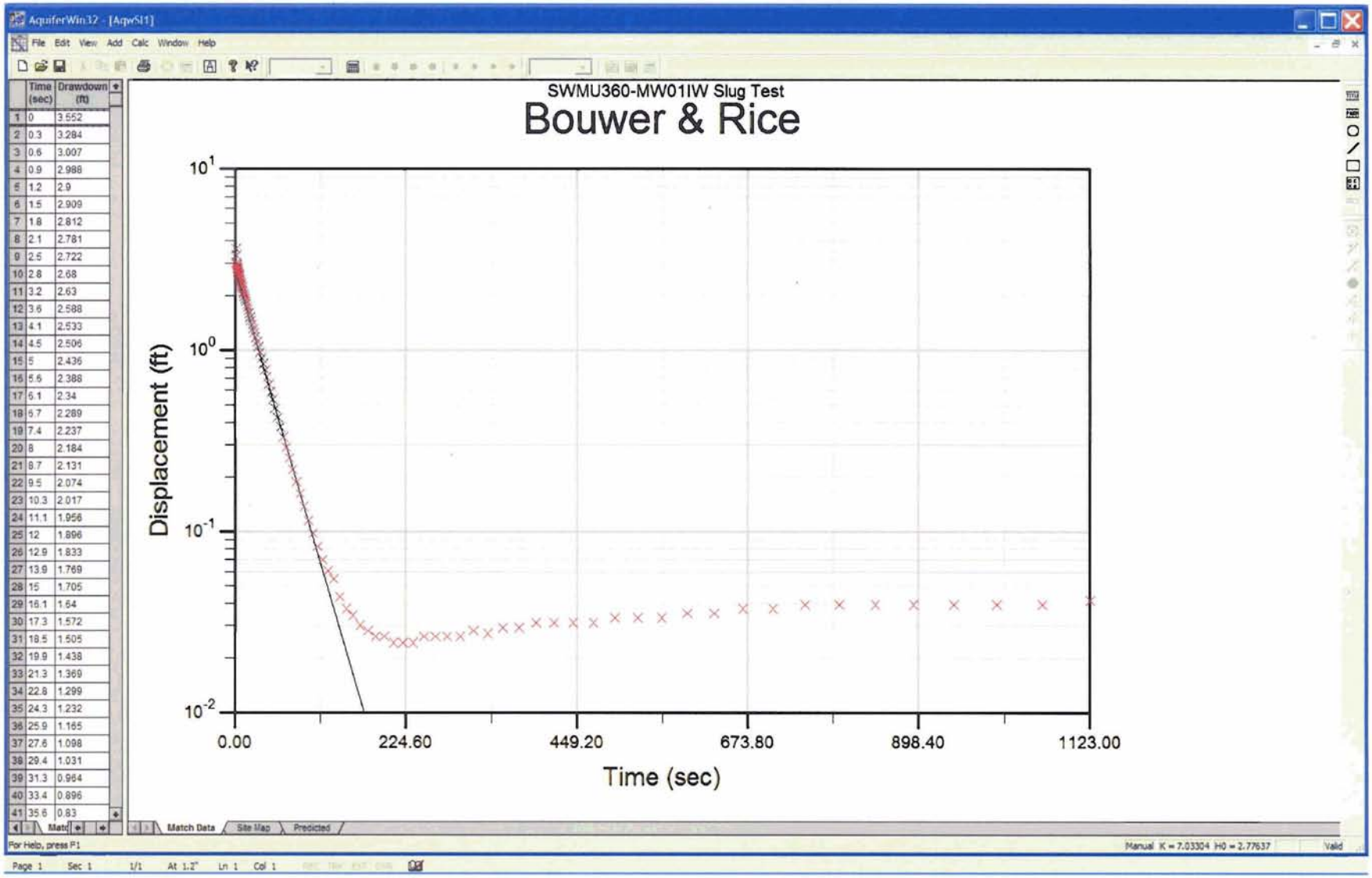
Signature(s): Matt [signature]

Appendix E

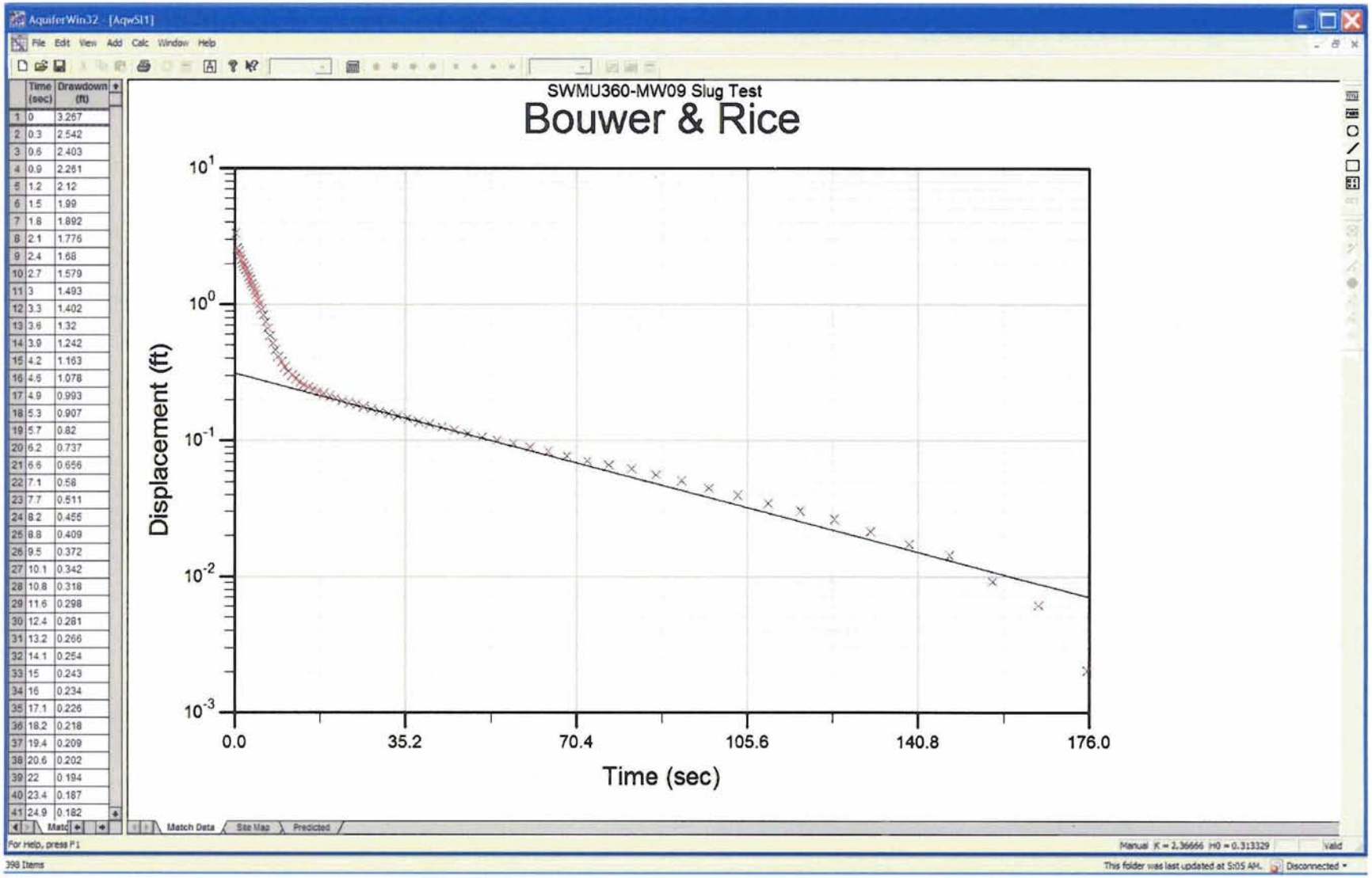
Hydraulic Conductivity Curves



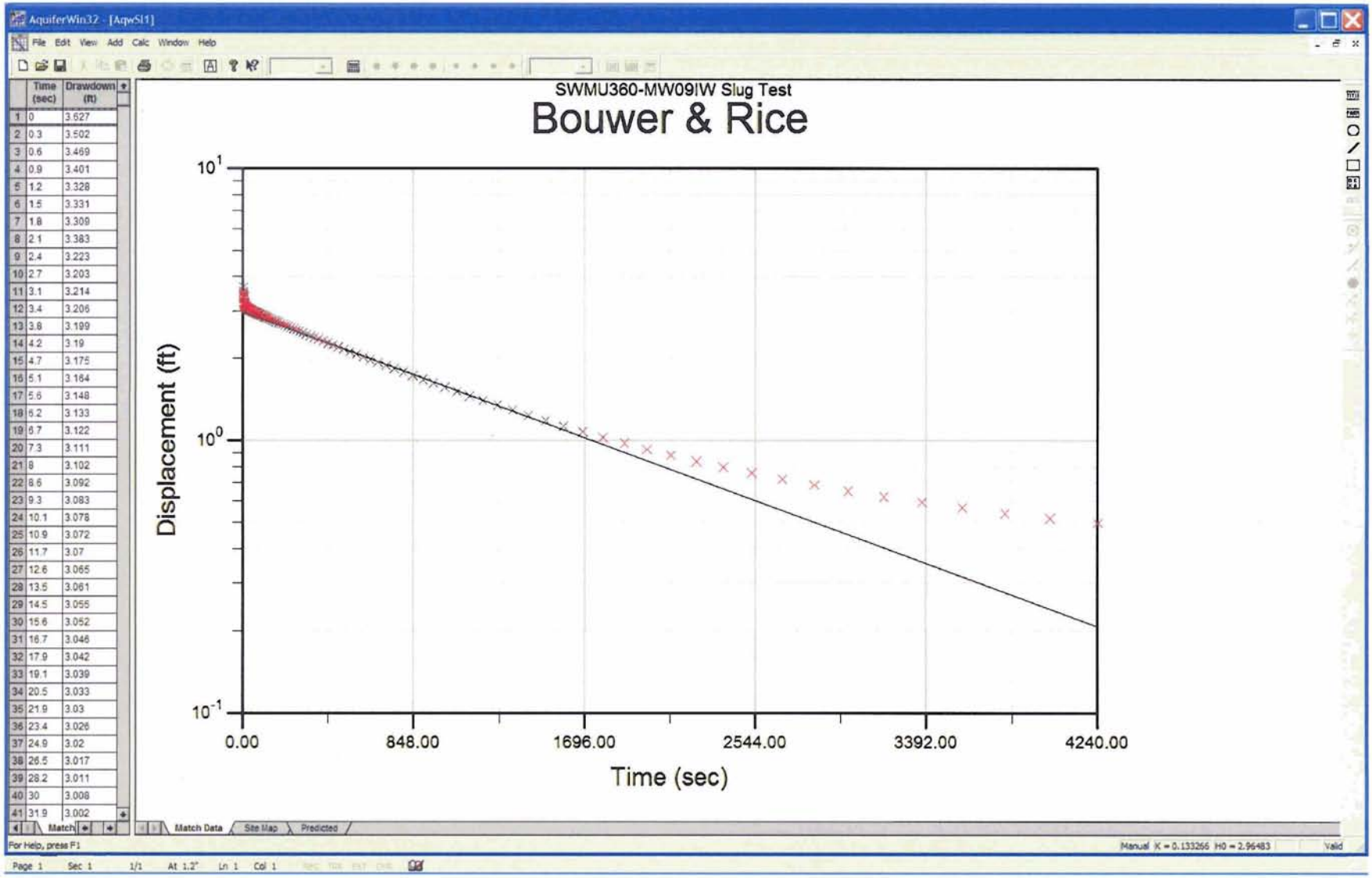
	Time (sec)	Drawdown (ft)
1	0	1.194
2	0.3	0.973
3	0.6	0.81
4	0.9	0.64
5	1.2	0.54
6	1.5	0.425
7	1.8	0.328
8	2.1	0.269
9	2.4	0.226
10	2.7	0.178
11	3	0.126
12	3.3	0.111
13	3.6	0.09
14	4	0.071
15	4.3	0.056
16	4.7	0.043
17	5.1	0.032
18	5.6	0.024
19	6	0.018
20	6.5	0.014
21	7.1	0.011
22	7.6	0.01
23	8.2	0.009
24	8.9	0.007
25	9.5	0.006
26	10.2	0.006
27	11	0.005
28	11.8	0.004
29	12.6	0.004
30	13.5	0.004
31	14.4	0.004
32	15.4	0.003
33	16.5	0.003
34	17.6	0.002
35	18.8	0.002
36	20	0.002
37	21.4	0.002
38	22.8	0.002
39	24.3	0.002
40	25.8	0.001
41	27.4	0.002



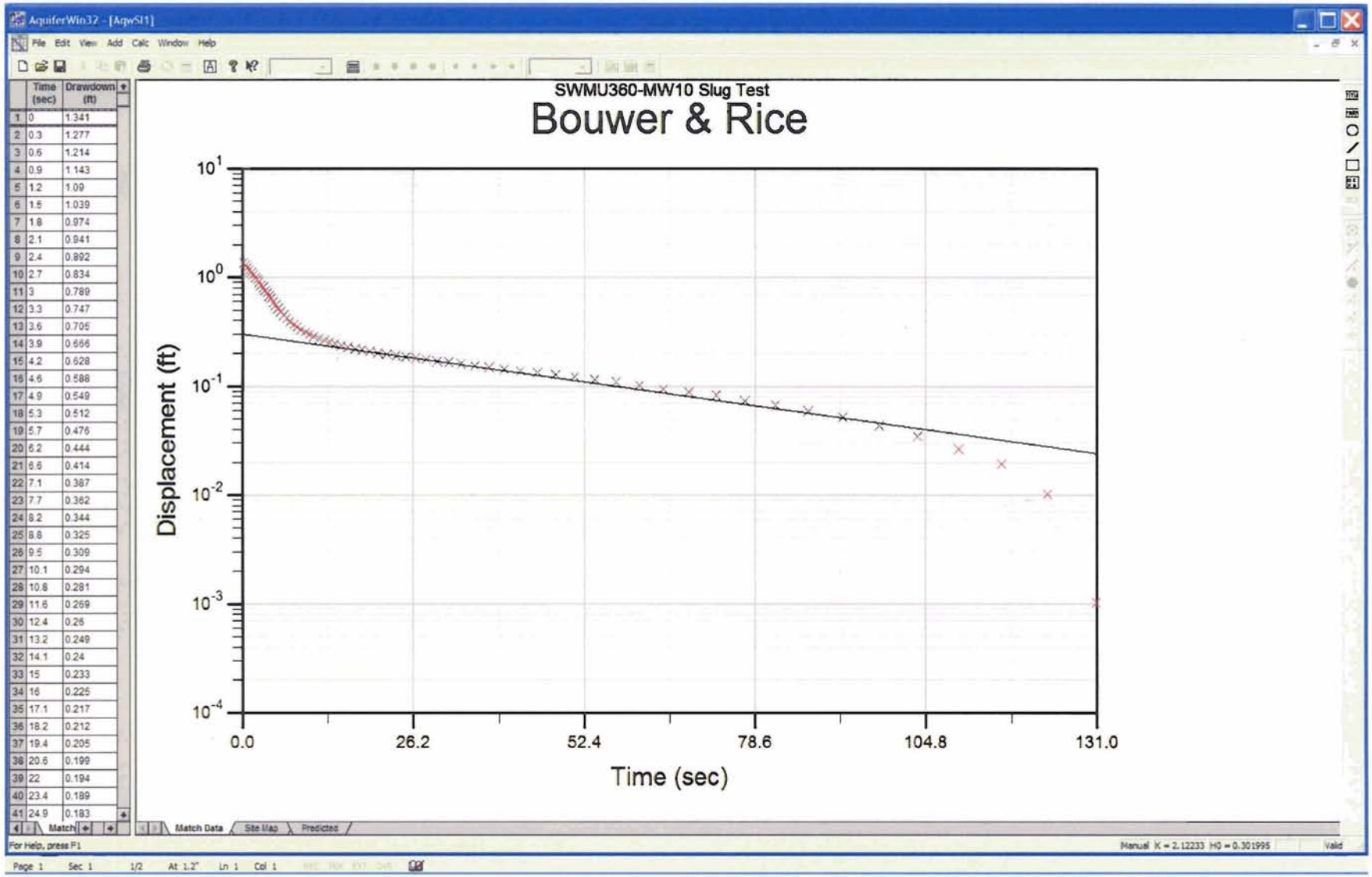
	Time (sec)	Drawdown (ft)
1	0	3.552
2	0.3	3.284
3	0.6	3.007
4	0.9	2.988
5	1.2	2.9
6	1.5	2.909
7	1.8	2.812
8	2.1	2.781
9	2.5	2.722
10	2.8	2.68
11	3.2	2.63
12	3.6	2.588
13	4.1	2.533
14	4.5	2.506
15	5	2.436
16	5.6	2.388
17	6.1	2.34
18	6.7	2.289
19	7.4	2.237
20	8	2.184
21	8.7	2.131
22	9.5	2.074
23	10.3	2.017
24	11.1	1.956
25	12	1.896
26	12.9	1.833
27	13.9	1.769
28	15	1.705
29	16.1	1.64
30	17.3	1.572
31	18.5	1.505
32	19.9	1.438
33	21.3	1.369
34	22.8	1.299
35	24.3	1.232
36	25.9	1.165
37	27.6	1.098
38	29.4	1.031
39	31.3	0.964
40	33.4	0.896
41	35.6	0.83



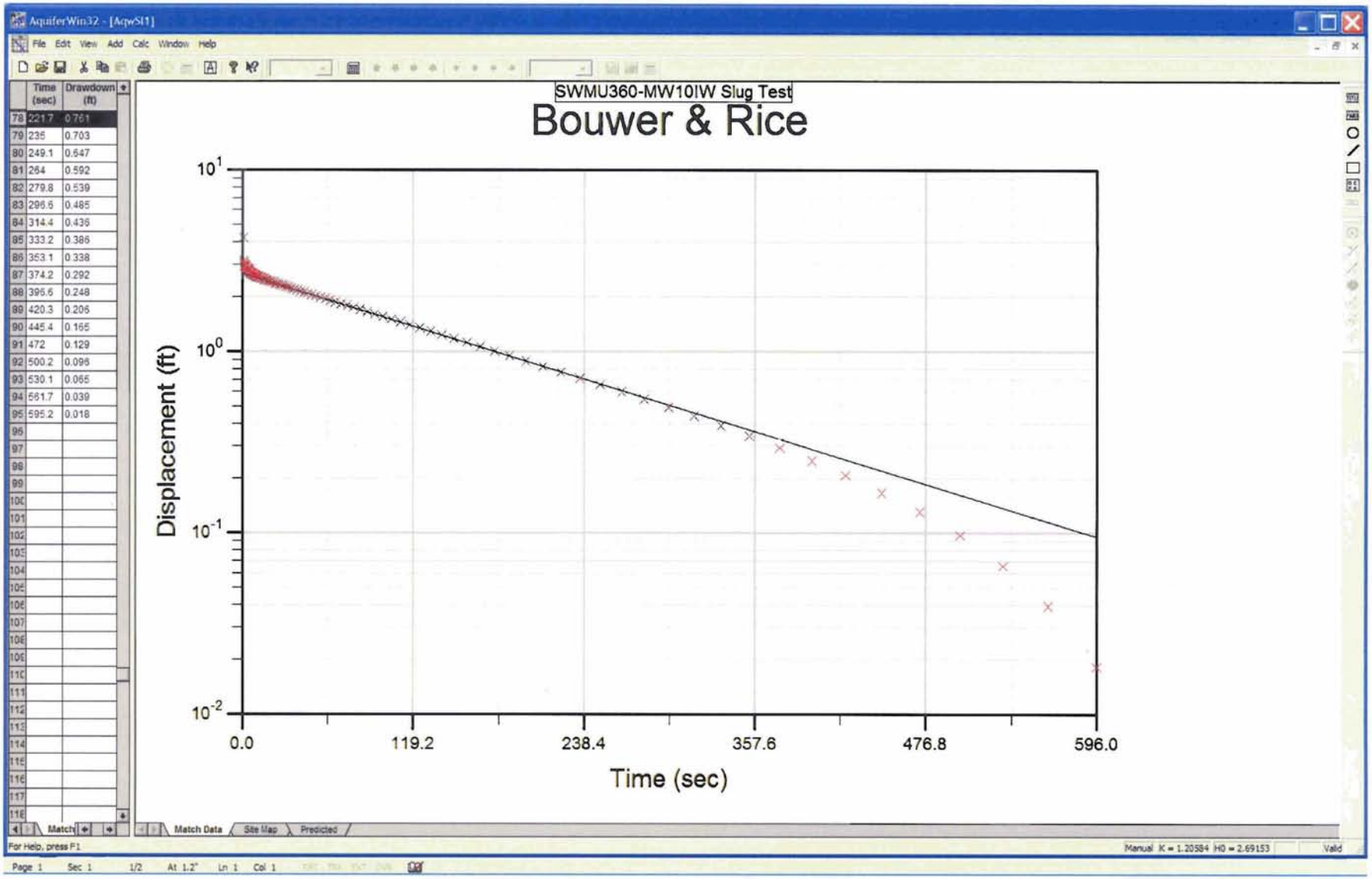
	Time (sec)	Drawdown (ft)
1	0	3.267
2	0.3	2.542
3	0.6	2.403
4	0.9	2.261
5	1.2	2.12
6	1.5	1.99
7	1.8	1.892
8	2.1	1.776
9	2.4	1.68
10	2.7	1.579
11	3	1.493
12	3.3	1.402
13	3.6	1.32
14	3.9	1.242
15	4.2	1.163
16	4.6	1.078
17	4.9	0.993
18	5.3	0.907
19	5.7	0.82
20	6.2	0.737
21	6.6	0.656
22	7.1	0.58
23	7.7	0.511
24	8.2	0.455
25	8.8	0.409
26	9.5	0.372
27	10.1	0.342
28	10.8	0.318
29	11.6	0.298
30	12.4	0.281
31	13.2	0.266
32	14.1	0.254
33	15	0.243
34	16	0.234
35	17.1	0.226
36	18.2	0.218
37	19.4	0.209
38	20.6	0.202
39	22	0.194
40	23.4	0.187
41	24.9	0.182



	Time (sec)	Drawdown (ft)
1	0	3.627
2	0.3	3.502
3	0.6	3.469
4	0.9	3.401
5	1.2	3.328
6	1.5	3.331
7	1.8	3.309
8	2.1	3.383
9	2.4	3.223
10	2.7	3.203
11	3.1	3.214
12	3.4	3.206
13	3.8	3.199
14	4.2	3.19
15	4.7	3.175
16	5.1	3.164
17	5.6	3.148
18	6.2	3.133
19	6.7	3.122
20	7.3	3.111
21	8	3.102
22	8.6	3.092
23	9.3	3.083
24	10.1	3.078
25	10.9	3.072
26	11.7	3.07
27	12.6	3.065
28	13.5	3.061
29	14.5	3.055
30	15.6	3.052
31	16.7	3.046
32	17.9	3.042
33	19.1	3.039
34	20.5	3.033
35	21.9	3.03
36	23.4	3.026
37	24.9	3.02
38	26.5	3.017
39	28.2	3.011
40	30	3.008
41	31.9	3.002



	Time (sec)	Drawdown (ft)
1	0	1.341
2	0.3	1.277
3	0.6	1.214
4	0.9	1.143
5	1.2	1.09
6	1.5	1.039
7	1.8	0.974
8	2.1	0.941
9	2.4	0.892
10	2.7	0.834
11	3	0.789
12	3.3	0.747
13	3.6	0.705
14	3.9	0.666
15	4.2	0.628
16	4.6	0.588
17	4.9	0.549
18	5.3	0.512
19	5.7	0.476
20	6.2	0.444
21	6.6	0.414
22	7.1	0.387
23	7.7	0.362
24	8.2	0.344
25	8.8	0.325
26	9.5	0.309
27	10.1	0.294
28	10.8	0.281
29	11.6	0.269
30	12.4	0.26
31	13.2	0.249
32	14.1	0.24
33	15	0.233
34	16	0.225
35	17.1	0.217
36	18.2	0.212
37	19.4	0.205
38	20.6	0.199
39	22	0.194
40	23.4	0.189
41	24.9	0.183



	Time (sec)	Drawdown (ft)
78	221.7	0.761
79	236	0.703
80	249.1	0.647
81	264	0.592
82	279.8	0.539
83	296.6	0.485
84	314.4	0.436
85	333.2	0.386
86	353.1	0.338
87	374.2	0.292
88	396.6	0.248
89	420.3	0.206
90	445.4	0.165
91	472	0.129
92	500.2	0.096
93	530.1	0.065
94	561.7	0.039
95	595.2	0.018

TABLE 3-2

SUMMARY OF HYDRAULIC CONDUCTIVITY ESTIMATES
SWMU 360
RCRA FACILITY INVESTIGATION
MCB, CAMP LEJEUNE, NORTH CAROLINA

Well Name	Test Date	Hydraulic Conductivity Estimate						Well Skin?	Lithology
		R1	R2	R3	F1	F2	Avg.		
Surficial aquifer									
360-MW02	7/26/2003	4.0	2.8[1]	NT	NT	NT	3.4	N	F Sand, trace silt & F Sand/Clay layers
360-MW02IW	7/26/2003	1.5	1.5	NT	1.4	1.4	1.5	N	F Sand, trace silt
360-MW05	7/25/2003	(3)	(3)	NT	NT	NT	--	Y	F Sand, little to some silt
360-MW06	7/25/2003	4.0	2.9	5.2	NT	NT	4.0	N	F Sand, little silt
360-MW08	7/26/2003	7.9	7.4	7.4	NT	NT	7.6	Y	Clay and F Sand layers
1817-MW01[4]	7/26/2003	4.5[1]	3.6	4.8[1]	NT	NT	4.3	Y	No information
Average hydraulic conductivity in the Surficial aquifer at SWMU 360							4.2		
Castle Hayne aquifer									
360-MW01	7/26/2003	26.4	38.4	44.9	NT	NT	36.6	Y	F/C Sand (C-H)
360-MW01IW	7/26/2003	1.8	4.0	NT	4.2	32.7	10.7	Y	F/C Sand and Gravel (C-H)
360-MW03	7/26/2003	63.1	32.7	31.2	NT	NT	42.3		F/C Gravel and F/C Sand (C-H)
360-MW03IW	7/26/2003	0.5	0.5	NT	0.6	0.6	0.6	N	F/C Gravel and F Sand layers (C-H)
360-MW04[2]	7/26/2003	22.2	14.4	17.2	NT	NT	17.9	N	F Sand, trace shell frag & silt (C-H)
360-MW07	7/26/2003	25.8	26.8	24.5	NT	NT	25.7	N	F/C Sand, some f/c gravel (C-H)
Avg hydraulic conductivity in the Castle Hayne aquifer at SWMU 36(							22.3		

Notes: K values are in feet per day (ft/day)

"R1" refers to rising-head test #1, "F2" refers to falling-head test #2, etc.

[1]Average of two lines

[2]The KGS model did not fit R3 data, Bouwer & Rice used

[3]Test not valid, water level failed to recover to the initial level

[4]The KGS model fit R2 data, however estimates for R1 & R3 inconsistent with R2 and site lithology, and two orders of magnitude lower than historical estimates of that formation. Used Bouwer & Rice for R1 & R3. Used Bouwer & Rice for R1 & R3.

NT - No test preformed

C-H - Sediments of the Castle Hayne aquifer

Appendix F

Laboratory Report for Geotechnical Analyses

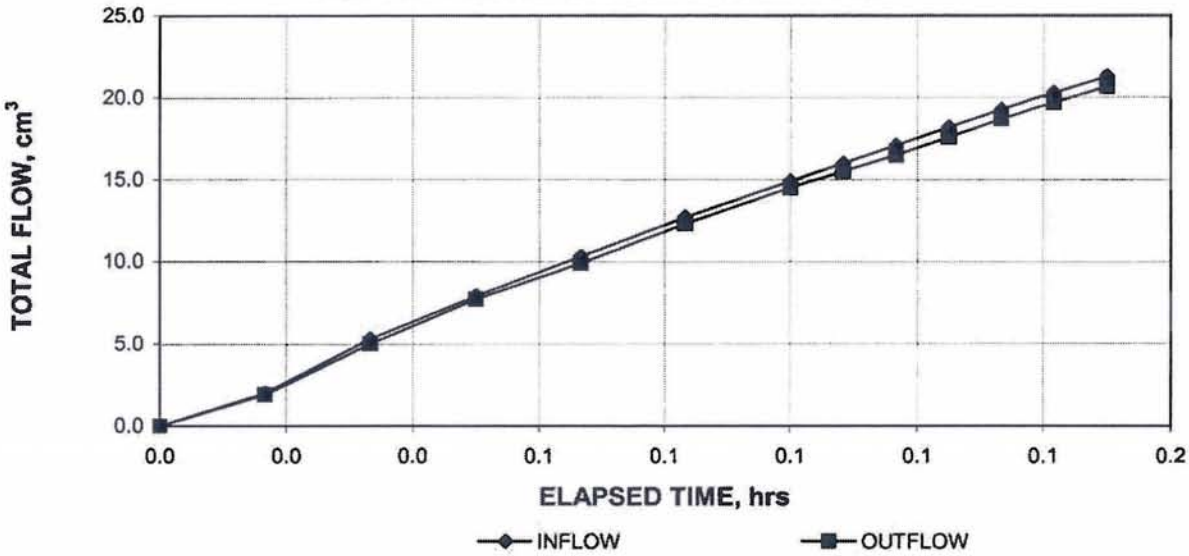
PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

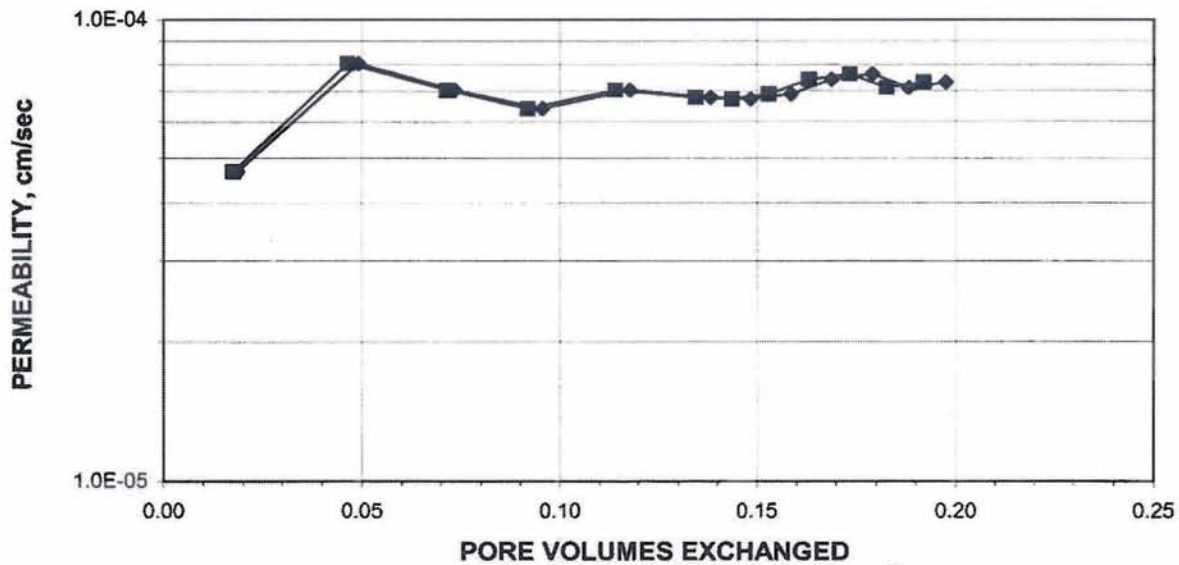
Client	CH2M HILL	Boring No.	SWMU360
Client Project	CAMP LEJEUNE	Depth (ft.)	14-16
Project No.	2006-508-01	Sample No.	MW10
Lab ID No.	2006-508-01-01		

AVERAGE PERMEABILITY = 7.4E-05 cm/sec @ 20°C
AVERAGE PERMEABILITY = 7.4E-07 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: MCW Date: 2/1/2006 Checked By: GBM Date: 2-2-06

DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Lab1\c\2006 PROJECTS\2006-508\[2006-508-01-01 PERM.xls]Sheet1

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

geotechnics
INTEGRITY IN TESTING

Client	CH2M HILL	Boring No.	SWMU360
Client Project	CAMP LEJEUNE	Depth (ft.)	14-16
Project No.	2006-508-01	Sample No.	MW10
Lab ID No.	2006-508-01-01		
		Specific Gravity	2.70 Assumed
		Sample Condition	Undisturbed

Visual Description: LIGHT BROWN SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	315	306
Wt. of Tare & WS (gm.)	414.65	681.49
Wt. of Tare & DS (gm.)	373.07	575.91
Wt. of Tare (gm.)	110.37	88.13
Wt. of Water (gm.)	41.58	105.58
Wt. of DS (gm.)	262.70	487.78
Moisture Content (%)	**15.8**	**21.6**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	591.98	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (gm.)	591.98	621.71
Length 1 (in.)	3.094	2.954
Length 2 (in.)	3.150	2.911
Length 3 (in.)	3.048	2.943
Top Diameter (in.)	2.832	2.827
Middle Diameter (in.)	2.850	2.725
Bottom Diameter (in.)	2.856	2.860
Average Length (in.)	3.10	2.94
Average Area (in.^{2})	6.36	6.18
Sample Volume (cm^3)	322.89	297.10
Unit Wet Wt. (gm./ cm^3)	1.83	2.09
Unit Wet Wt. (pcf)	114.4	130.6
Unit Dry Wt. (pcf)	98.8	107.4
Unit Dry Wt. (gm./ cm^3)	1.58	1.72
Void Ratio, e	0.71	0.57
Porosity, n	0.41	0.36
Pore Volume (cm^3)	133.6	107.8

Tested By: MCW Date: 2/1/2006 Checked By: GBM Date: 2-2-06

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

geotechnics
INTEGRITY IN TESTING

Client	CH2M HILL	Boring No.	SWMU360
Client Project	CAMP LEJEUNE	Depth (ft.)	14-16
Project No.	2006-508-01	Sample No.	MW10
Lab ID No.	2006-508-01-01		

Pressure Heads (Constant)	
Top Cap (psi)	38.5
Bottom Cap (psi)	40.0
Cell (psi)	52.0
Total Pressure Head (cm)	105.5
Hydraulic Gradient	14.14

Final Sample Dimensions	
Sample Length (cm), L	7.46
Sample Diameter (cm)	7.12
Sample Area (cm^2), A	39.84
Inflow Burette Area (cm^2), a-in	0.882
Outflow Burette Area (cm^2), a-out	0.880
B Parameter (%)	83

AVERAGE PERMEABILITY = 7.4E-05 cm/sec @ 20°C
AVERAGE PERMEABILITY = 7.4E-07 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
2/1/2006	9	27	0.0	0.0	0.0	130.3	0	20.5	NA
2/1/2006	9	28	0.0	2.0	1.9	125.9	0	20.5	4.7E-05
2/1/2006	9	29	0.0	5.3	5.0	118.7	0	20.5	8.0E-05
2/1/2006	9	30	0.1	7.9	7.7	112.7	0	20.5	7.0E-05
2/1/2006	9	31	0.1	10.3	9.9	107.5	0	20.5	6.4E-05
2/1/2006	9	32	0.1	12.7	12.3	102.1	0	20.5	7.0E-05
2/1/2006	9	33	0.1	14.9	14.5	97.1	0	20.5	6.8E-05
2/1/2006	9	33.5	0.1	16.0	15.5	94.7	0	20.5	6.7E-05
2/1/2006	9	34	0.1	17.1	16.5	92.3	0	20.5	6.9E-05
2/1/2006	9	34.5	0.1	18.2	17.6	89.8	0	20.5	7.4E-05
2/1/2006	9	35	0.1	19.3	18.7	87.4	0	20.5	7.6E-05
2/1/2006	9	35.5	0.1	20.3	19.7	85.1	0	20.5	7.1E-05
2/1/2006	9	36	0.2	21.3	20.7	82.8	1	20.5	7.3E-05

Tested By: MCW Date: 2/1/2006 Checked By: GBM Date: 2-2-06

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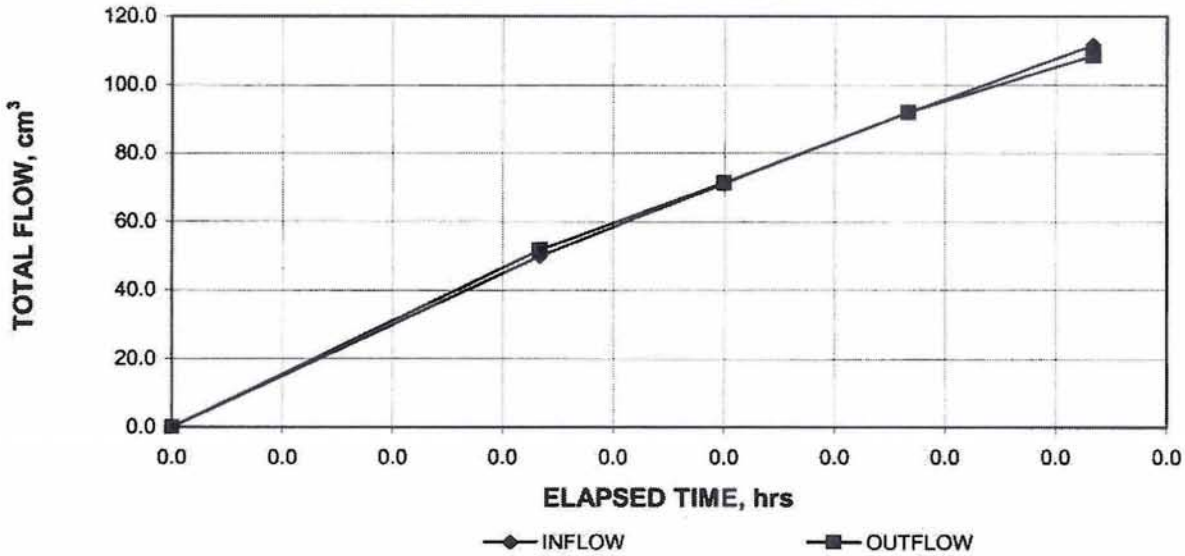
PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

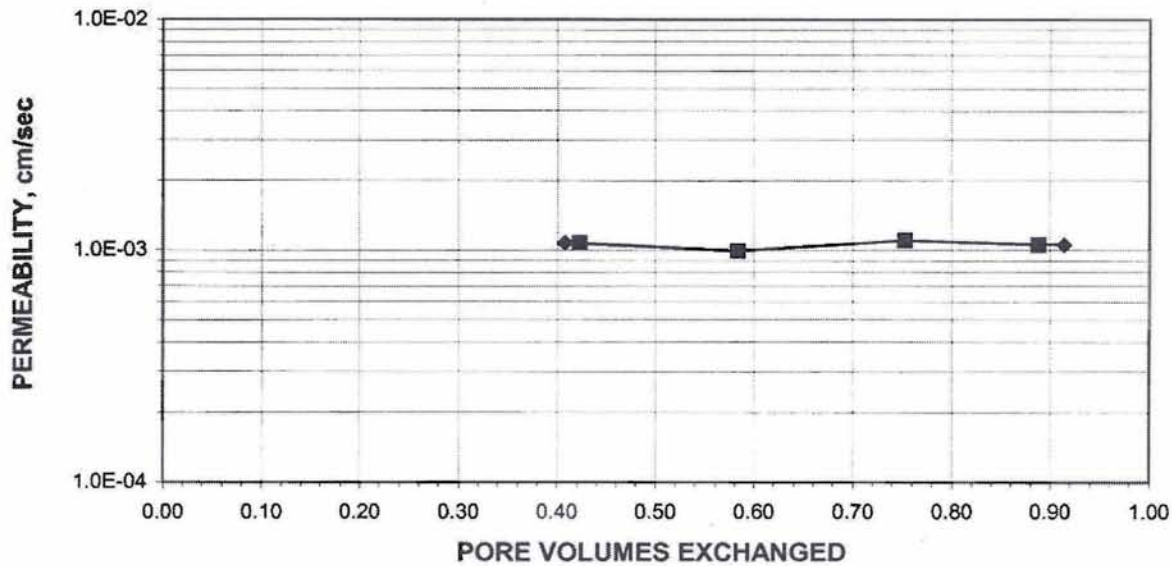
Client	CH2M HILL	Boring No.	SWMU360
Client Project	CAMP LEJEUNE	Depth (ft.)	9.5-10.0
Project No.	2006-508-01	Sample No.	MW09
Lab ID No.	2006-508-01-02		

AVERAGE PERMEABILITY = 1.1E-03 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.1E-05 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: MCW Date: 1/30/2006 Checked By: GBM Date: 2-2-06

DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Lab1\c\2006 PROJECTS\2006-508\[2006-508-01-02 PERM.xls]Sheet1

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

Geotechnics
INTEGRITY IN TESTING

Client	CH2M HILL	Boring No.	SWMU360
Client Project	CAMP LEJEUNE	Depth (ft.)	9.5-10.0
Project No.	2006-508-01	Sample No.	MW09
Lab ID No.	2006-508-01-02		
		Specific Gravity	2.70 Assumed
		Sample Condition	Undisturbed

Visual Description: BROWN SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	K-7	315
Wt. of Tare & WS (gm.)	485.99	673.98
Wt. of Tare & DS (gm.)	458.10	556.73
Wt. of Tare (gm.)	109.93	110.40
Wt. of Water (gm.)	27.89	117.25
Wt. of DS (gm.)	348.17	446.33
Moisture Content (%)	**8.0**	**26.3**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	491.77	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (gm.)	491.77	574.90
Length 1 (in.)	2.886	2.598
Length 2 (in.)	2.911	2.673
Length 3 (in.)	2.868	2.603
Top Diameter (in.)	2.823	2.984
Middle Diameter (in.)	2.804	2.900
Bottom Diameter (in.)	2.838	2.918
Average Length (in.)	2.89	2.62
Average Area (in.^{2})	6.25	6.76
Sample Volume (cm^3)	295.97	290.81
Unit Wet Wt. (gm./ cm^3)	1.66	1.98
Unit Wet Wt. (pcf)	103.7	123.4
Unit Dry Wt. (pcf)	96.0	97.7
Unit Dry Wt. (gm./ cm^3)	1.54	1.57
Void Ratio, e	0.76	0.72
Porosity, n	0.43	0.42
Pore Volume (cm^3)	127.3	122.2

Tested By: MCW Date: 1/30/2006 Checked By: Gem Date: 2-2-06

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

geotechnics
INTEGRITY IN TESTING

Client	CH2M HILL	Boring No.	SWMU360
Client Project	CAMP LEJEUNE	Depth (ft.)	9.5-10.0
Project No.	2006-508-01	Sample No.	MW09
Lab ID No.	2006-508-01-02		

Pressure Heads (Constant)	
Top Cap (psi)	38.5
Bottom Cap (psi)	40.0
Cell (psi)	48.0
Total Pressure Head (cm)	105.5
Hydraulic Gradient	15.82

Final Sample Dimensions	
Sample Length (cm), L	6.67
Sample Diameter (cm)	7.45
Sample Area (cm^2), A	43.62
Inflow Burette Area (cm^2), a-in	4.906
Outflow Burette Area (cm^2), a-out	4.570
B Parameter (%)	65

AVERAGE PERMEABILITY = 1.1E-03 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.1E-05 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
2/1/2006	11	51.5	0.0	0.0	0.0	126.4	0	21.8	NA
2/1/2006	11	52.5	0.0	49.8	51.7	104.9	0	21.8	1.1E-03
2/1/2006	11	53	0.0	71.1	71.3	96.3	0	21.8	9.9E-04
2/1/2006	11	53.5	0.0	91.9	92.0	87.5	0	21.8	1.1E-03
2/1/2006	11	54	0.0	111.6	108.5	79.9	1	21.8	1.1E-03

Tested By: MCW Date: 1/30/2006 Checked By: GEM Date: 2-2-06

DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Lab1\c\2006 PROJECTS\2006-508\[2006-508-01-02 PERM.xls]Sheet1

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PERMEABILITY TEST

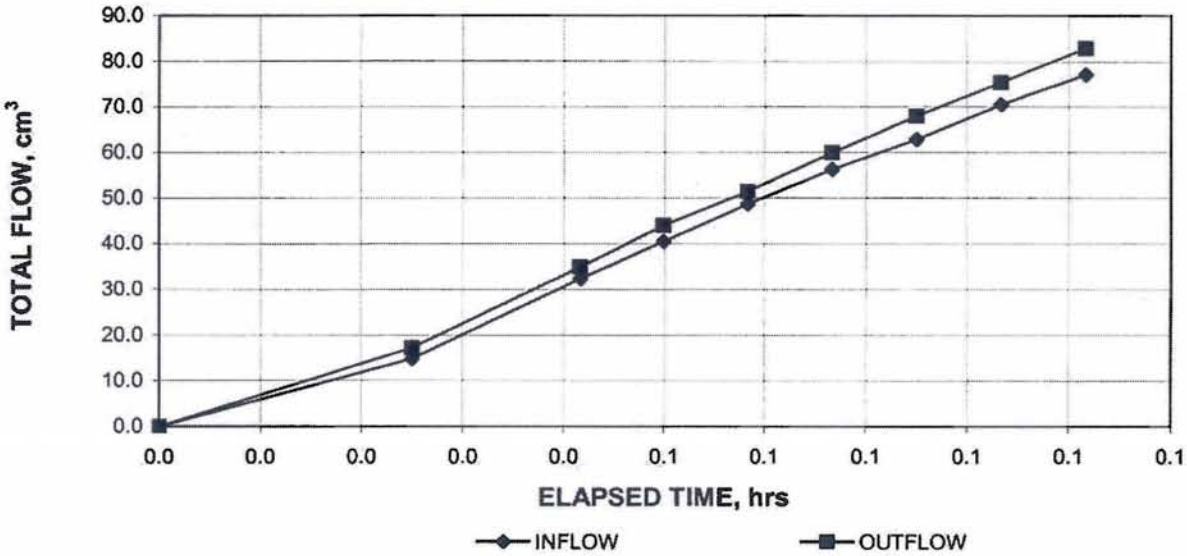
ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

geotechnics
INTEGRITY IN TESTING

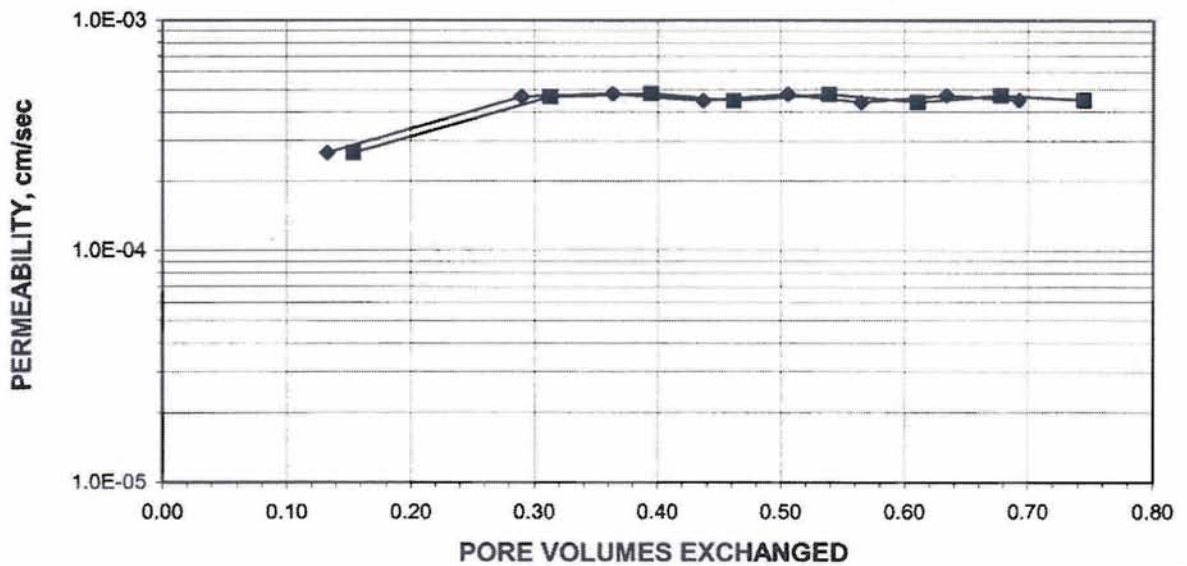
Client	CH2M HILL	Boring No.	SWMU360
Client Project	CAMP LEJEUNE	Depth (ft.)	3.5-4.0
Project No.	2006-508-01	Sample No.	SB33
Lab ID No.	2006-508-01-03		

AVERAGE PERMEABILITY = 4.6E-04 cm/sec @ 20°C
AVERAGE PERMEABILITY = 4.6E-06 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: MCW Date: 1/30/2006 Checked By: GSM Date: 2-2-06

DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Lab1\c\2006 PROJECTS\2006-508\[2006-508-01-03 PERM.xls]Sheet1

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

geotechnics
INTEGRITY IN TESTING

Client	CH2M HILL	Boring No.	SWMU360
Client Project	CAMP LEJEUNE	Depth (ft.)	3.5-4.0
Project No.	2006-508-01	Sample No.	SB33
Lab ID No.	2006-508-01-03		
		Specific Gravity	2.70 Assumed
		Sample Condition	Undisturbed

Visual Description: BROWN SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	313	K-7
Wt. of Tare & WS (gm.)	496.77	767.49
Wt. of Tare & DS (gm.)	442.74	657.03
Wt. of Tare (gm.)	110.68	109.92
Wt. of Water (gm.)	54.03	110.46
Wt. of DS (gm.)	332.06	547.11
Moisture Content (%)	**16.3**	**20.2**

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	642.47	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (gm.)	642.47	664.12
Length 1 (in.)	3.107	3.052
Length 2 (in.)	3.107	3.052
Length 3 (in.)	3.108	3.053
Top Diameter (in.)	2.839	2.829
Middle Diameter (in.)	2.856	2.838
Bottom Diameter (in.)	2.852	2.840
Average Length (in.)	3.11	3.05
Average Area ($in.^2$)	6.37	6.32
Sample Volume (cm^3)	324.61	315.89
Unit Wet Wt. ($gm./cm^3$)	1.98	2.10
Unit Wet Wt. (pcf)	123.5	131.2
Unit Dry Wt. (pcf)	106.3	109.2
Unit Dry Wt. ($gm./cm^3$)	1.70	1.75
Void Ratio, e	0.59	0.54
Porosity, n	0.37	0.35
Pore Volume (cm^3)	120.0	111.2

Tested By: MCW Date: 1/30/2006 Checked By: GEM Date: 2-2-06

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PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)

geotechnics
INTEGRITY IN TESTING

Client	CH2M HILL	Boring No.	SWMU360
Client Project	CAMP LEJEUNE	Depth (ft.)	3.5-4.0
Project No.	2006-508-01	Sample No.	SB33
Lab ID No.	2006-508-01-03		

Pressure Heads (Constant)	
Top Cap (psi)	38.5
Bottom Cap (psi)	40.0
Cell (psi)	44.0
Total Pressure Head (cm)	105.5
Hydraulic Gradient	13.60

Final Sample Dimensions	
Sample Length (cm), L	7.75
Sample Diameter (cm)	7.20
Sample Area (cm^2), A	40.74
Inflow Burette Area (cm^2), a-in	4.889
Outflow Burette Area (cm^2), a-out	5.078
B Parameter (%)	93

AVERAGE PERMEABILITY = 4.6E-04 cm/sec @ 20°C
AVERAGE PERMEABILITY = 4.6E-06 m/sec @ 20°C

DATE	TIME		ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD h	FLOW (0 flow)	TEMP.	INCREMENTAL PERMEABILITY @ 20°C
(mm/dd/yy)	(hr)	(min)	(hr)	(cm^3)	(cm^3)	(cm)	(1 stop)	(°C)	(cm/sec)
2/1/2006	3	27	0.0	0.0	0.0	126.5	0	21.1	NA
2/1/2006	3	28.5	0.0	14.8	17.1	120.1	0	21.1	2.7E-04
2/1/2006	3	29.5	0.0	32.2	34.8	113.1	0	21.1	4.7E-04
2/1/2006	3	30	0.0	40.4	44.0	109.6	0	21.1	4.8E-04
2/1/2006	3	30.5	0.1	48.6	51.4	106.5	0	21.1	4.5E-04
2/1/2006	3	31	0.1	56.3	60.0	103.2	0	21.1	4.8E-04
2/1/2006	3	31.5	0.1	62.8	68.0	100.3	0	21.1	4.4E-04
2/1/2006	3	32	0.1	70.5	75.4	97.3	0	21.1	4.7E-04
2/1/2006	3	32.5	0.1	77.0	82.8	94.5	1	21.1	4.5E-04

Tested By: MCW Date: 1/30/2006 Checked By: GZM Date: 2-2-06

DCN: CT-22 DATE: 01-08-99 REVISION:2 \\Lab1\c\2006 PROJECTS\2006-508\[2006-508-01-03 PERM.xls]Sheet1

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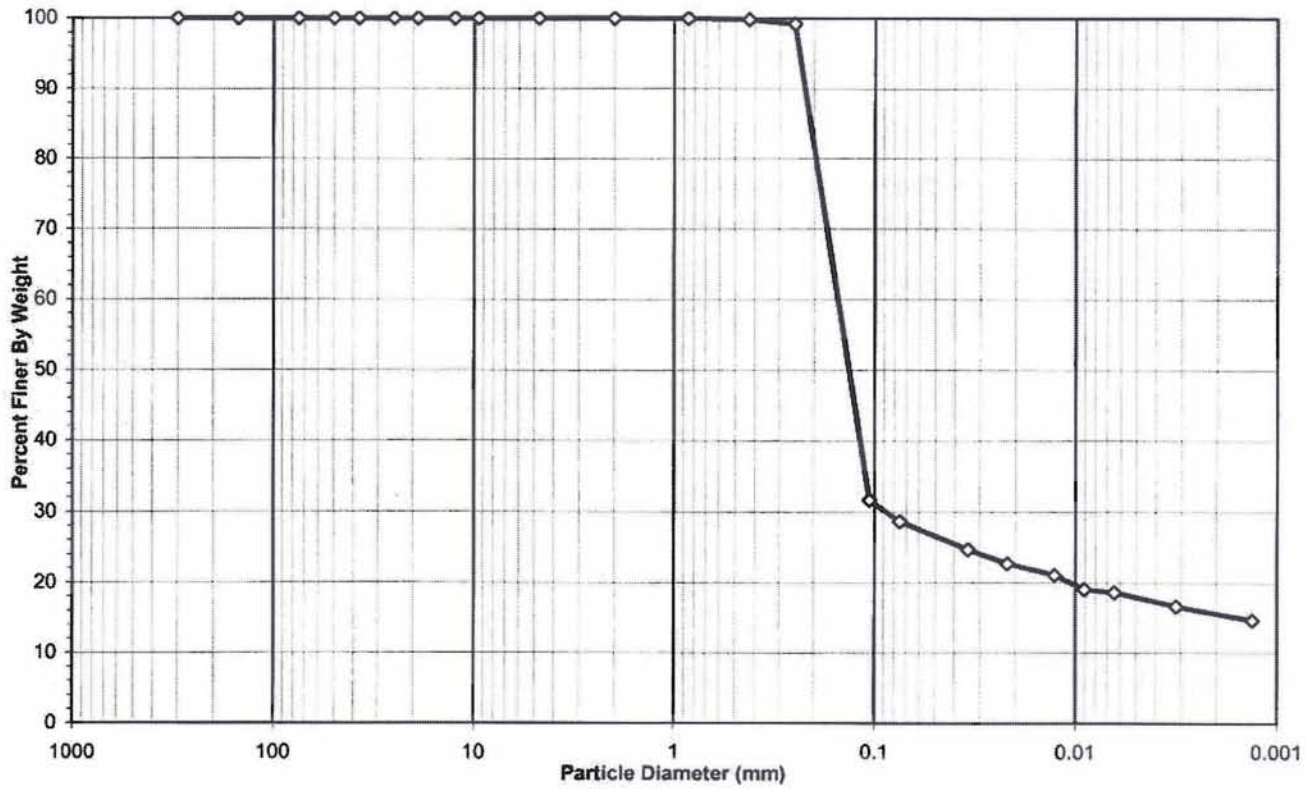
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	15.5-16
Project No.	2006-508-01	Sample No.	MW10
Lab ID	2006-508-01-01	Soil Color	**LIGHT BROWN**

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay

12" 6" 3" 3/4" 3/8" #4 #10 #20 #40 #140 #200



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	71.36
Finer Than #200	*Silt & Clay*	28.64

USCS Symbol *sm, ASSUMED*

USCS Classification *SILTY SAND*

DCN: CT-S3P DATE:02/15/05 REVISION:8 \\Lab1\c\2006 PROJECTS\2006-508\[2006-508-01-01 #10 Split Hydro rev 8.xls]Sheet1

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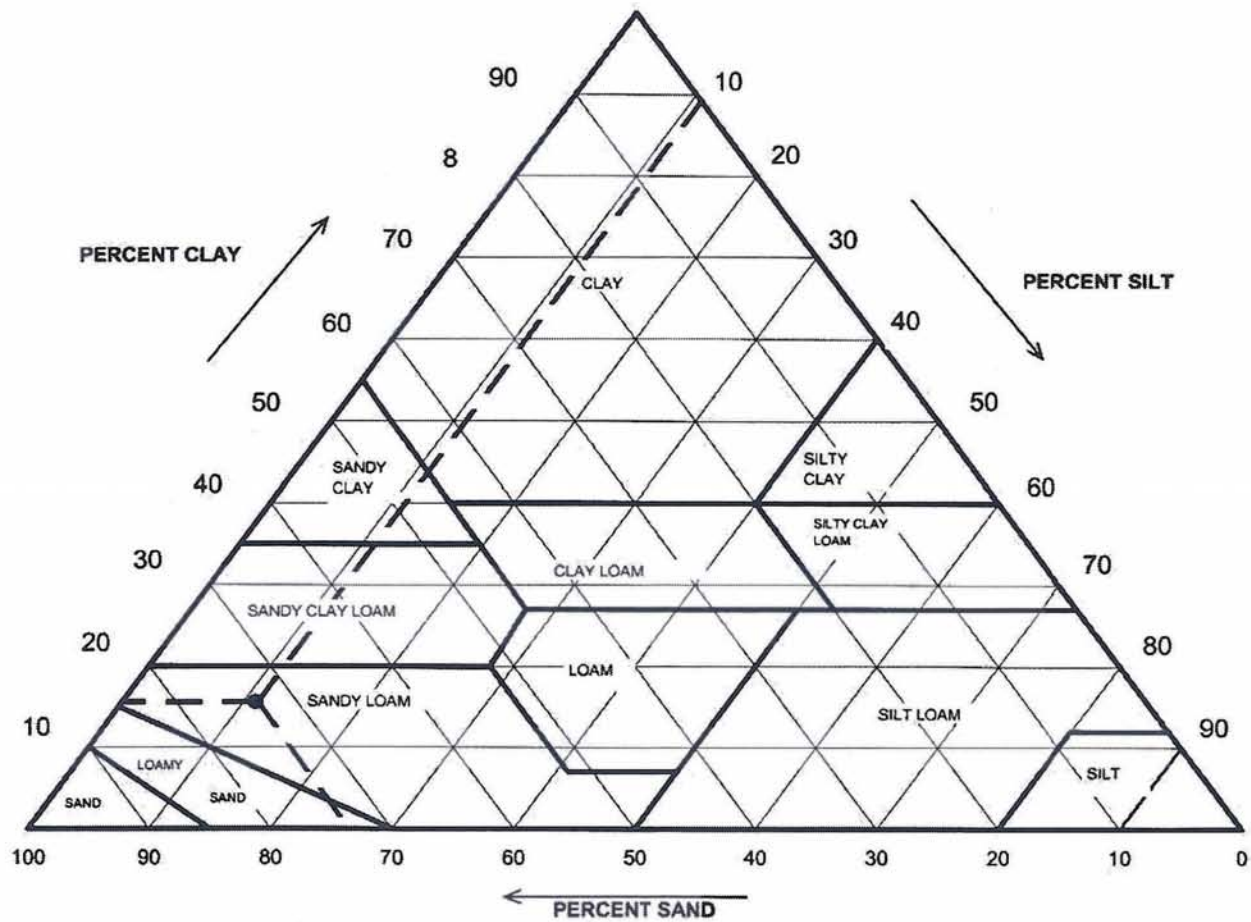
USDA CLASSIFICATION CHART

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	15.5-16
Project No.	2006-508-01	Sample No.	MW10
Lab ID	2006-508-01-01	Soil Color	LIGHT BROWN



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
		Gravel	0.00	**0.00**
2	100.00	*Sand*	73.42	**73.42**
0.05	26.58	*Silt*	10.99	**10.99**
0.002	15.59	*Clay*	15.59	**15.59**

USDA Classification: ***SANDY LOAM***

DCN: CT-S3P DATE:02/15/05 REVISION:8 \\Lab1\c\2006 PROJECTS\2006-508\[2006-508-01-01 #10 Split Hydro rev 8.xls]Sheet1

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geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS #10 SPLIT

ASTM D 422-63 (SOP-S3)

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	15.5-16
Project No.	2006-508-01	Sample No.	MW10
Lab ID	2006-508-01-01	Soil Color	**LIGHT BROWN**

Moisture Content/sieve +10 Material		Moisture Content for Hydrometer Portion	
Tare No.	208	Tare No.	I-1
Wgt.Tare + Wet Soil (gm)	341.41	Wgt.Tare + Wet Soil (gm)	37.08
Wgt.Tare + Dry Soil (gm)	317.10	Wgt.Tare + Dry Soil (gm)	36.95
Weight of Tare (gm)	169.83	Weight of Tare (gm)	22.08
Weight of Water (gm)	24.31	Weight of Water (gm)	0.13
Weight of Dry Soil (gm)	147.27	Weight of Dry Soil (gm)	14.87
Moisture Content (%)	**16.5**	**Moisture Content (%)**	**0.9**

Soil Specimen Data			
Wet Weight +#10 Material (gm)	171.58	Weight of the Dry Sample (gm)	196.84
Dry Weight +#10 Material(gm)	147.3	Weight of minus #200 material (gm)	14.20
Wet Weight Hydro. Material.(gm)	50.00	Weight of plus #200 material (gm)	182.64
Dry Weight Hydro. Material (gm)	49.57		
Total Dry Weight Sample (gm)	196.84	**J-FACTOR (%FINER THAN #10)**	**1.0000**

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.00	0.00	0.00	100.00	**100.00**
#20	0.85	0.01	0.02	0.02	99.98	**99.98**
#40	0.425	0.07	0.14	0.16	99.84	**99.84**
#60	0.250	0.31	0.63	0.79	99.21	**99.21**
#140	0.106	33.48	67.55	68.33	31.67	**31.67**
#200	0.075	1.50	3.03	71.36	28.64	**28.64**
Pan	-	14.20	28.64	100.00	-	-

Notes :

Tested By JGC Date 1/30/2006 Checked By GBM Date 2-6-06

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INTEGRITY IN TESTING

HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	15.5-16
Project No.	2006-508-01	Sample No.	MW10
Lab ID	2006-508-01-01	Soil Color	**LIGHT BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	17.0	17.0	21.1	4.64	12.4	24.7	0.01327	0.0345	**24.7**
5		16.0	21.1	4.64	11.4	22.7	0.01327	0.0219	**22.7**
15		15.2	21.1	4.64	10.6	21.1	0.01327	0.0127	**21.1**
30		14.2	21.0	4.67	9.5	19.0	0.01328	0.0091	**19.0**
60		14.0	21.0	4.67	9.3	18.6	0.01328	0.0064	**18.6**
250		13.0	21.0	4.67	8.3	16.6	0.01328	0.0032	**16.6**
1440		12.0	21.0	4.67	7.3	14.6	0.01328	0.0013	**14.6**

Soil Specimen Data		Other Corrections	
Tare + Dry Material (gm)	49.57	a - Factor	0.99
Weight of Tare (gm)	0		
Weight of Deflocculant (gm)	5.0	Percent Finer than # 10	100.00
Weight of Dry Material (gm)	49.57		
		Specific Gravity	2.7 Assumed

Note:

Tested By MCW Date 2/1/2006 Checked By [signature] Date 2-6-06

DCN: CT-S3P DATE:02/15/05 REVISION:8 \\Lab1\c\2006 PROJECTS\2006-508\[2006-508-01-01 #10 Split Hydro rev 8.xls]Sheet1

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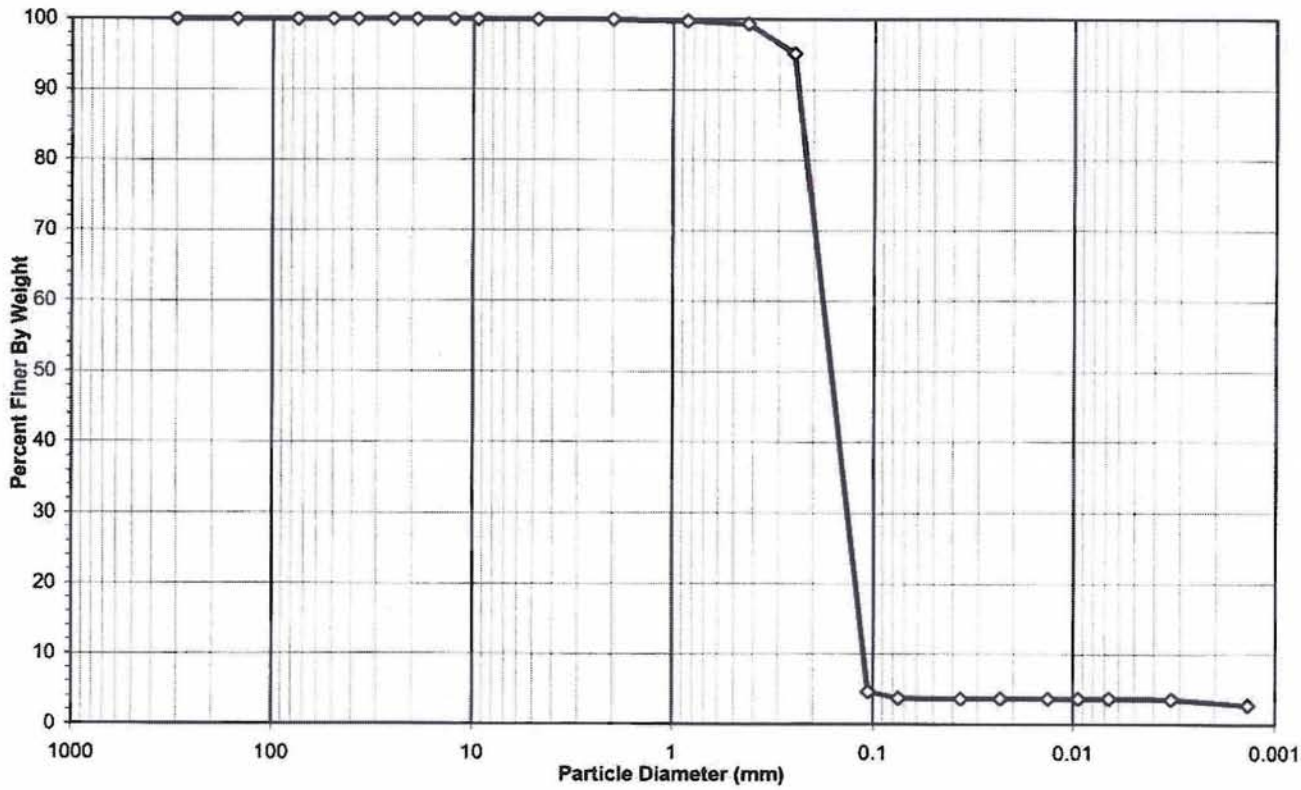
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	8-10
Project No.	2006-508-01	Sample No.	MW09
Lab ID	2006-508-01-02	Soil Color	**LIGHT BROWN**

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay

12" 6" 3" 3/4" 3/8" #4 #10 #20 #40 #140 #200



USCS Summary					
Sieve Sizes (mm)		**Percentage**			
Greater Than #4	*Gravel*	0.00			
#4 To #200	*Sand*	96.26			
Finer Than #200	*Silt & Clay*	3.74			
			D60 =	**0.179**	
USCS Symbol	***sp, ASSUMED***		**D30 =**	**0.135**	**CC = 0.91**
USCS Classification	***POORLY GRADED SAND***		**D10 =**	**0.112**	**CU = 1.61**

DCN: CT-S3P DATE:02/15/05 REVISION:3 *b1\C\2006 PROJECTS\2006-508 CH2M HILL\[2006-508-01-02 #10 Split Hydro rev 8.xls]Sheet1*

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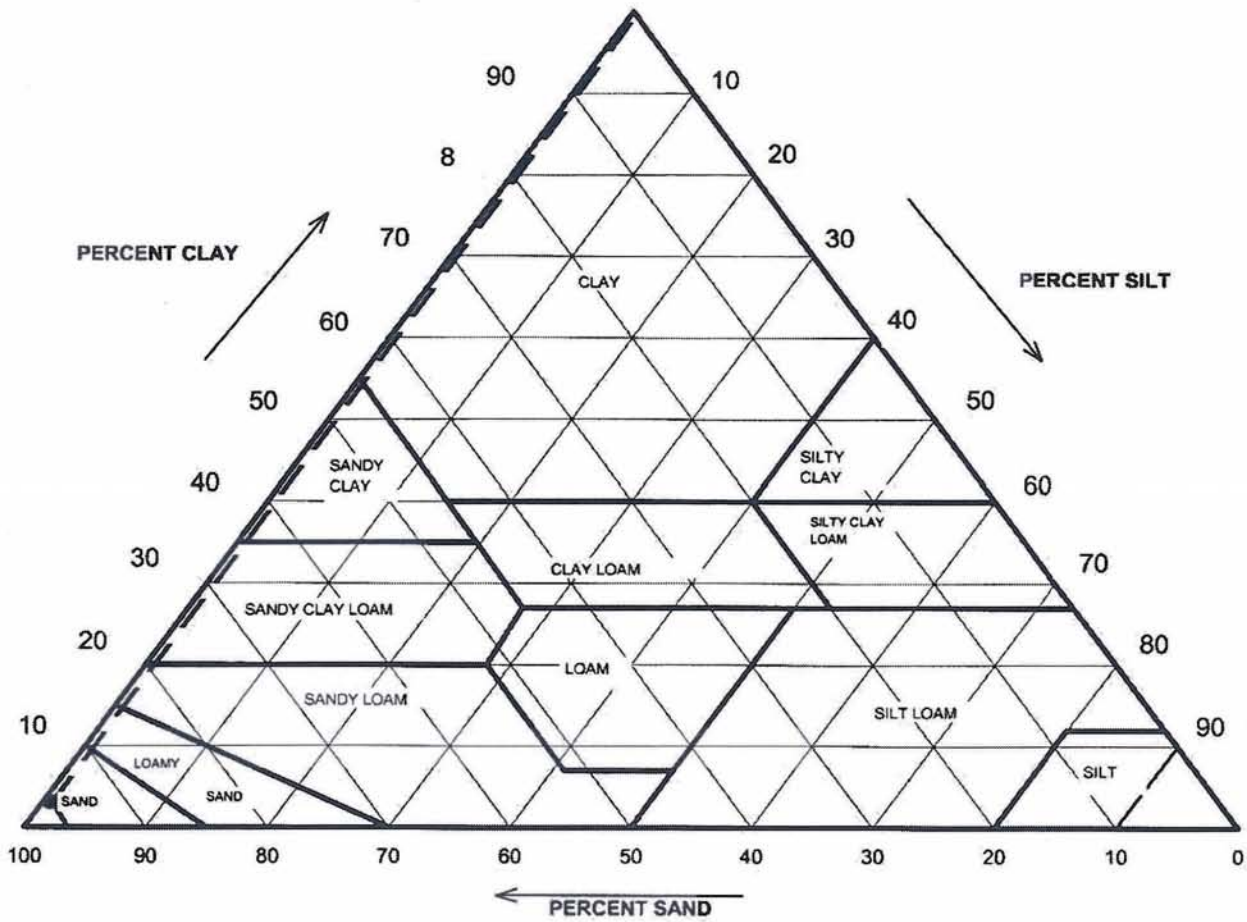
USDA CLASSIFICATION CHART

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	8-10
Project No.	2006-508-01	Sample No.	MW09
Lab ID	2006-508-01-02	Soil Color	LIGHT BROWN



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
		Gravel	0.04	**0.00**
2	99.96	*Sand*	96.27	**96.31**
0.05	3.69	*Silt*	0.61	**0.61**
0.002	3.08	*Clay*	3.08	**3.08**

USDA Classification: ***SAND***

DCN: CT-S3P DATE:02/15/05 REVISION:\\lab1\C\2006 PROJECTS\2006-508 CH2M HILL\[2006-508-01-02 #10 Split Hydro rev 8.xls]Sheet1

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WASH SIEVE ANALYSIS #10 SPLIT

ASTM D 422-63 (SOP-S3)

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	8-10
Project No.	2006-508-01	Sample No.	MW09
Lab ID	2006-508-01-02	Soil Color	**LIGHT BROWN**

Moisture Content/sieve +10 Material		Moisture Content for Hydrometer Portion	
Tare No.	250	Tare No.	T-1
Wgt.Tare + Wet Soil (gm)	303.90	Wgt.Tare + Wet Soil (gm)	36.95
Wgt.Tare + Dry Soil (gm)	297.30	Wgt.Tare + Dry Soil (gm)	36.85
Weight of Tare (gm)	169.35	Weight of Tare (gm)	21.95
Weight of Water (gm)	6.60	Weight of Water (gm)	0.10
Weight of Dry Soil (gm)	127.95	Weight of Dry Soil (gm)	14.90
Moisture Content (%)	**5.2**	**Moisture Content (%)**	**0.7**

Soil Specimen Data			
Wet Weight +#10 Material (gm)	134.55	Weight of the Dry Sample (gm)	177.62
Dry Weight +#10 Material(gm)	128.0	Weight of minus #200 material (gm)	1.86
Wet Weight Hydro. Material.(gm)	50.00	Weight of plus #200 material (gm)	175.76
Dry Weight Hydro. Material (gm)	49.67		
Total Dry Weight Sample (gm)	177.62	**J-FACTOR (%FINER THAN #10)**	**0.9996**

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.05	0.04	0.04	99.96	**99.96**
#20	0.85	0.11	0.22	0.22	99.78	**99.74**
#40	0.425	0.21	0.42	0.64	99.36	**99.32**
#60	0.250	2.09	4.21	4.85	95.15	**95.11**
#140	0.106	44.95	90.50	95.36	4.64	**4.64**
#200	0.075	0.45	0.91	96.26	3.74	**3.74**
Pan	-	1.86	3.74	100.00	-	**-**

Notes :

Tested By MCW Date 1/30/2006 Checked By MES Date 2-6-06

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HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	8-10
Project No.	2006-508-01	Sample No.	MW09
Lab ID	2006-508-01-02	Soil Color	**LIGHT BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	6.5	6.5	21.0	4.67	1.8	3.7	0.01328	0.0367	**3.7**
5		6.5	21.0	4.67	1.8	3.7	0.01328	0.0232	**3.7**
15		6.5	21.0	4.67	1.8	3.7	0.01328	0.0134	**3.7**
30		6.5	21.0	4.67	1.8	3.7	0.01328	0.0095	**3.7**
60		6.5	21.0	4.67	1.8	3.7	0.01328	0.0067	**3.7**
250		6.5	20.8	4.72	1.8	3.5	0.01332	0.0033	**3.5**
1440		6.1	20.8	4.72	1.4	2.7	0.01332	0.0014	**2.7**

Soil Specimen Data		**Other Corrections**	
Tare + Dry Material (gm)	49.67	a - Factor	0.99
Weight of Tare (gm)	0		
Weight of Deflocculant (gm)	5.0	Percent Finer than # 10	99.96
Weight of Dry Material (gm)	49.67		
		Specific Gravity	2.7 Assumed

Note:

Tested By MCW Date 2/1/2006 Checked By MAS Date 2-6-06

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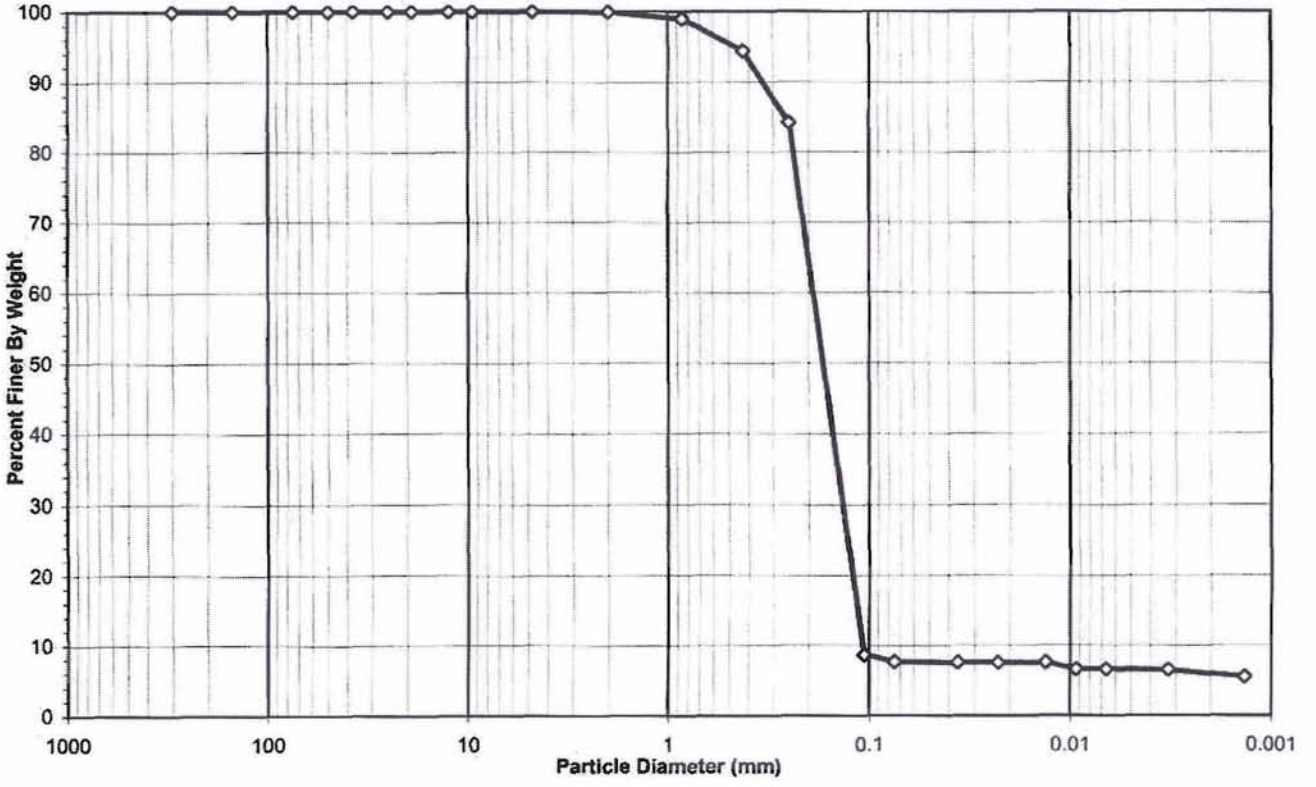
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	2-4
Project No.	2006-508-01	Sample No.	SB33
Lab ID	2006-508-01-03	Soil Color	**BROWN**

	SIEVE ANALYSIS			HYDROMETER	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay

12" 6" 3" 3/4" 3/8" #4 #10 #20 #40 #140 #200



USCS Summary

Sieve Sizes (mm)		Percentage
Greater Than #4	*Gravel*	0.00
#4 To #200	*Sand*	92.29
Finer Than #200	*Silt & Clay*	7.71

		D60 =	0.190		
USCS Symbol	***sp-sm, ASSUMED***	D30 =	0.135	CC =	**0.89**
USCS Classification	***POORLY GRADED SAND WITH SILT***	D10 =	0.108	CU =	**1.76**

DCN: CT-S3P DATE:02/15/05 REVISION:3 b:\C\2006 PROJECTS\2006-508 CH2M HILL\[2006-508-01-03 #10 Split Hydro rev 8.xls]Sheet1

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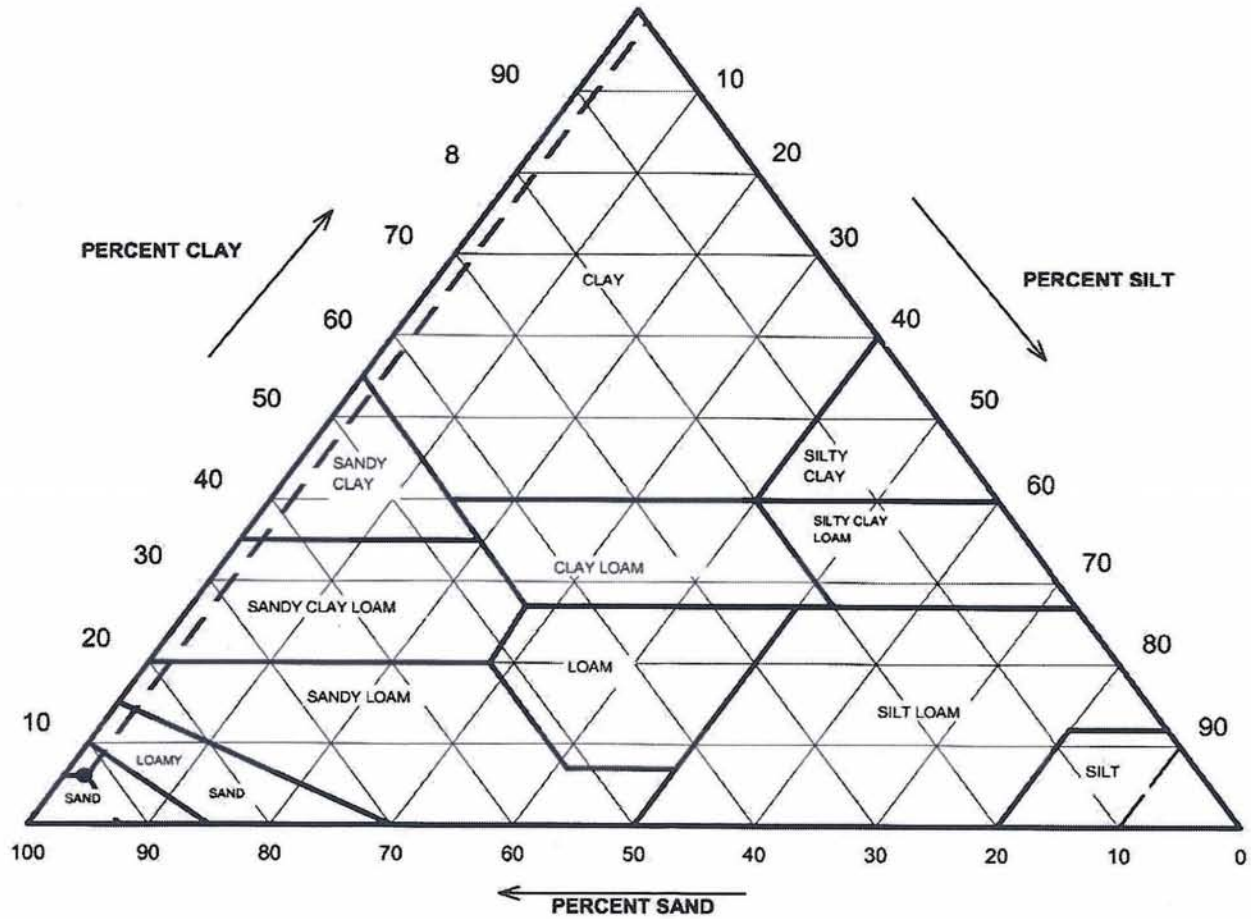
USDA CLASSIFICATION CHART

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	2-4
Project No.	2006-508-01	Sample No.	SB33
Lab ID	2006-508-01-03	Soil Color	BROWN



Particle Size (mm)	Percent Finer	USDA SUMMARY	Actual Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
		Gravel	0.07	**0.00**
2	99.93	*Sand*	92.27	**92.34**
0.05	7.66	*Silt*	1.71	**1.71**
0.002	5.95	*Clay*	5.95	**5.95**

USDA Classification: ***SAND***

DCN: CT-S3P DATE:02/15/05 REVISION:1&b1\C\2006 PROJECTS\2006-508 CH2M HILL\[2006-508-01-03 #10 Split Hydro rev 8.xls]Sheet1

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WASH SIEVE ANALYSIS #10 SPLIT

ASTM D 422-63 (SOP-S3)

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	2-4
Project No.	2006-508-01	Sample No.	SB33
Lab ID	2006-508-01-03	Soil Color	**BROWN**

Moisture Content/sieve +10 Material		Moisture Content for Hydrometer Portion	
Tare No.	G-5	Tare No.	V-1
Wgt.Tare + Wet Soil (gm)	250.45	Wgt.Tare + Wet Soil (gm)	36.96
Wgt.Tare + Dry Soil (gm)	243.80	Wgt.Tare + Dry Soil (gm)	36.90
Weight of Tare (gm)	147.83	Weight of Tare (gm)	21.94
Weight of Water (gm)	6.65	Weight of Water (gm)	0.06
Weight of Dry Soil (gm)	95.97	Weight of Dry Soil (gm)	14.96
Moisture Content (%)	**6.9**	**Moisture Content (%)**	**0.4**

Soil Specimen Data			
Wet Weight +#10 Material (gm)	102.62	Weight of the Dry Sample (gm)	145.77
Dry Weight +#10 Material(gm)	96.0	Weight of minus #200 material (gm)	3.84
Wet Weight Hydro. Material.(gm)	50.00	Weight of plus #200 material (gm)	141.93
Dry Weight Hydro. Material (gm)	49.80		
Total Dry Weight Sample (gm)	145.77	**J-FACTOR (%FINER THAN #10)**	**0.9993**

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated **Percent Finer (%)**
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.07	0.07	0.07	99.93	**99.93**
#20	0.85	0.49	0.98	0.98	99.02	**98.94**
#40	0.425	2.27	4.56	5.54	94.46	**94.39**
#60	0.250	5.06	10.16	15.70	84.30	**84.24**
#140	0.106	37.65	75.60	91.30	8.70	**8.69**
#200	0.075	0.49	0.98	92.29	7.71	**7.71**
Pan	-	3.84	7.71	100.00	-	-

Notes :

Tested By JGC Date 2/3/2006 Checked By [signature] Date 2-6-06

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	CH2M HILL	Boring No.	SWMU360
Client Reference	CAMP LEJEUNE	Depth (ft)	2-4
Project No.	2006-508-01	Sample No.	SB33
Lab ID	2006-508-01-03	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	9.0	8.5	21.0	4.67	3.8	7.6	0.01328	0.0363	**7.6**
5		8.5	21.0	4.67	3.8	7.6	0.01328	0.0229	**7.6**
15		8.5	21.0	4.67	3.8	7.6	0.01328	0.0132	**7.6**
30		8.0	21.0	4.67	3.3	6.6	0.01328	0.0094	**6.6**
60		8.0	21.0	4.67	3.3	6.6	0.01328	0.0066	**6.6**
250		8.0	20.8	4.72	3.3	6.5	0.01332	0.0033	**6.5**
1440		7.5	20.8	4.72	2.8	5.5	0.01332	0.0014	**5.5**

Soil Specimen Data		Other Corrections	
Tare + Dry Material (gm)	49.80	a - Factor	0.99
Weight of Tare (gm)	0		
Weight of Deflocculant (gm)	5.0	Percent Finer than # 10	99.93
Weight of Dry Material (gm)	49.80		
		Specific Gravity	2.7 Assumed

Note:

Tested By MCW Date 2/1/2006 Checked By [illegible] Date 2-6-06

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Appendix G

Chain of Custody Forms and Data Validation Summary Reports

SHEALY **Chain of Custody Record**

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
Cayce, South Carolina 29033
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 54531

Client: CH2M HILL	Report to Contact: L. PALMER	Telephone No. / Fax No. / E-mail: 704-329-0073	Quote No.
Address: 4824 PARKWAY PLAZA BLVD STE 200	Sampler's Signature: X James E Frank	Waybill No.	Page 1 of 1
City: CHARLOTTE State: NC Zip Code: 28217	Printed Name: JAMES FRANK	Analysis (Attach list if more space is needed.)	
Project Name: SWMU 360			
Project No.	P.O. No.		Lot No.

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	VOC 4 VIALS	5035 KIT	SOIL MOISTURE*	TOC	Remarks / Cooler I.D.
SWMU 360-IS45-1-3	12-13-2005	0905	C		✓		1✓					1✓	1	1			
SWMU 360-IS45-17-19	12-13-2005	0955	C		✓		✓1					1✓	1	1			
SWMU 360-IS34-1-3	12-13-2005	1535	C		✓		1					1	1	1	1		* SOIL MOISTURE/TOC SAME JAR
SWMU 360-IS34-16-18	12-13-2005	1605			✓		1					1	1	1			↓
SWMU 360-IS35-1-3	12-13-05	1630			✓		1					1	1	1			↓
SWMU 360-IS35-14-16	12-13-05	1650			✓		1					1	1	1	1		* ↓
SWMU 360-TB121305	12-13-05			✓						2							

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

Sample Disposal
☐ Return to Client ☒ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☐ Standard ☒ Rush (Specify) 7 day AS PER CONTRACT

QC Requirements (Specify)

1. Relinquished by: James E Frank	Date: 12-13-05	Time: 1750	1. Received by	Date	Time
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Laboratory received by	Date	Time

Comments

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. ______ °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-012 Effective Date: 08-04-02

SHEALY *Chain of Custody Record*

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
Cayce, South Carolina 29033
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 54532

Client	Report to Contact	Telephone No. / Fax No. / E-mail	Quote No.
CH2M HILL	L. PALMEZ / D. TOMCZAK	919-875-4311 x 19	

Address	Sampler's Signature	Waybill No.	Page 1 of 2
4824 PARKWAY PLAZA BLVD STE 200	X James E Frank		

City	State	Zip Code	Printed Name
CHARLOTTE	NC	28219	JAMES E FRANK

Project Name: SWMU 360

Project No.: | P.O. No.: | Lot No.:

Analysis (Attach list if more space is needed.)

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	VOC 4 vials 5035 KIT	SOIL MOISTURE	TOC	VOC 8260B 2	Remarks / Cooler I.D.
SWMU360-IS37-1-3	12-14-05	0850	C		✓		1					1	1	1			
SWMU360-IS37-P-1-3		0855	C		✓							1	1				
SWMU360-IS37-17-19		0945	C		✓		1					3	3	1	1		TRIPLICATE FOR MS/MSD
SWMU360-EB121405		1145		✓						3						3	
SWMU360-IS36-1-3		1245	C		✓		1					1	1	1	1		
SWMU360-IS36-17-19		1258	C		✓		1					1	1	1			
SWMU360-GW37-22-26		1355		✓						3						3	
SWMU360-FB121405		1405		✓						3						3	
SWMU360-GW37-38-42		1430		✓						3						3	
SWMU360-EB121405B		1445		✓						3						3	

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☒ Rush (Specify) 7 day AS PER CONTRACT

QC Requirements (Specify)

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by James E Frank	12-14-05	1730	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Laboratory received by		

Comments

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. ______ °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-012 Effective Date: 08-04-02

SHEALY

CompuChem
a division of Liberty Analytical Corp.

CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

12 00025

Page 2 of 2

Courier FED EX
Airbill No.
Sampling Complete? Y or (N)

Client/Reporting Information	Project Information
Company Name	Project Name
Address	Sampling Location
City State Zip	Turnaround time SAME
Project Contact SAME	Batch QC or Project Specific? If Specific, which Sample ID?
Phone #	Are aqueous samples field filtered for metals? Y or N
Sampler's Name	Are high concentrations expected? Y or N? If yes, which ID(s)?

Matrices: GW - Ground water; WW - Waste water; SW - Surface water; SO - Soil/Sediment; TB - Trip Blank; RI - Rinsate; WP - Wipe; O - Other

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	Number of Preserved Bottles: HCl	NaOH	HNO3	H2SO4	MEOH	Other	Requested Analysis (include method and bottle type): VOC 8260	pH / Sample Info (Lab Use)
	SWMU36Φ-GW42-22-26	12-14-06	1535	GW	3	3						3	
	SWMU36Φ-GW44-22-26	12-14-06	1645	GW	3	3						3	
*	SWMU36Φ-TB12140	—	—	WT	3	3						3	

Lab Use Only

Sample Unpacked By:
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:

Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Comments

* TRIP BLANKS

Sample Custody

Relinquished by:	Date/Time: 12-14-06 1730	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:

Subcontact? Y or N If yes, where? | Custody Seal(s) intact? Y or N | On Ice? Y or N | Cooler Temp: °C

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for customer

12 008826

CHAIN OF CUSTODY

CompuChem
a division of Liberty Analytical Corp.
501 Madison Ave. ANALYTICAL ENVIRONMENTAL
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Page 1 of 1

Courier FED EX
Airbill No.
Sampling Complete? Y or N

Client/Reporting Information	Project Information
Company Name: CH2M HILL	Project Name: SWMU 36d
Address: 3135 PORTSMOUTH CT STE 304	Sampling Location: CAMP LEJEUNE NC
City: RALEIGH State: NC Zip: 27604	Turnaround time: —
Project Contact: DAN TOMCZAK	Batch QC or Project Specific? If Specific, which Sample ID? —
Phone #: 919-875-4311 x19	Are aqueous samples field filtered for metals? Y or N —
Sampler's Name: JAMES E FRANK	Are high concentrations expected? Y or N? If yes, which ID(s)? —

Requested Analysis (include method and bottle type): TOD

Matrices: GW - Ground water; WW - Waste water; SW - Surface water; SO - Soil/Sediment; TB - Trip Blank; RI - Rinsate; WP - Wipe; O - Other

pH / Sample Info (Lab Use)

CompuChem No (Lab Use)	Field ID	Collection: Date	Collection: Time	Matrix	# of bottles	Number of Preserved Bottles: HCl	NaOH	HNO3	H2SO4	MEOH	Other	TOD
	SWMU36d-IS37-14-RI	12-14-04	1015	SO								2
	SWMU36d-IS35-14-RI	"	1100	SO								2
	SWMU36d-IS34-14-RI	"	1135	SO								
	SWMU36d-IS36-14-RI	"	1255	SO								

Lab Use Only

Sample Unpacked By:
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:
Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Comments

Sample Custody

Relinquished by: James E Frank	Date/Time: 12-14-04 1730	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Subcontact? Y or N If yes, where?	Custody Seal(s) intact? Y or N	On Ice? Y or N	Cooler Temp: °C

Samples stored 6[illegible] after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for cust[illegible]

SHEALY **Chain of Custody Record**

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vanta[illegible] [illegible]oint Drive
Cayce, South Carolina 29033
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 54[illegible]93

Client	Report to Contact	Telephone No. / Fax No. / E-mail	Quote No.
CH2M HILL	DAN TOMCZAK	919-875-4311	

Address	Sampler's Signature	Waybill No.	Page 1 of 1
3125 POPLARWOOD CT STE 304	x James E Frank		

City	State	Zip Code	Printed Name
RALEIGH	NC	27604	JAMES E FRANK

Project Name: SWMU 360 CTO-100

Project No.: P.O. No.:

Analysis (Attach list if more space is needed.): VOC 8260B

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	VOC 8260B									Remarks / Cooler I.D.
SWMU360-GW43-22-26	12-15-2005	0810	G	✓						3			3									
SWMU360-GW44-22-26		0855	G	✓						3			3									
SWMU360-GW44-38-42		0915	G	✓						3			3									
SWMU360-GW44-P-38-42		0920	G	✓						3			3									
SWMU360-EB121505		0940	G	✓						3			3									
SWMU360-GW40-22-26		1020	G	✓						9			9									* TRIPLICATE FOR MS/MSD
SWMU360-GW40-38-42		1055	G	✓						3			3									
SWMU360-TB121505		1110	G	✓						3			3									
SWMU360-GW39-22-26		1200	G	✓						3			3									
SWMU360-GW39-38-42		1225	G	✓						3			3									

Lot No.:

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☐ Standard ☒ Rush (Specify) 7 day AS PER CONTRACT

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished by: James E Frank	12-15-05	2100	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Laboratory received by		

Comments:

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. ______ °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

SHEALY Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
Cayce, South Carolina 29033
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 54692

Client	Report to Contact	Telephone No. / Fax No. / E-mail	Quote No.
Address	Sampler's Signature	Waybill No.	Page 2 of 2
City / State / Zip Code	X Printed Name	Analysis (Attach list if more space is needed.)	
Project Name			

SAVE

Project No.	P.O. No.			Matrix			No. of Containers by Preservative Type							Lot No.
Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	VOC 8260	Remarks / Cooler I.D.
SWMU360-GW38-22-26	12-15-05	1310	G	✓						3			3	
SWMU360-GW38-P-22-26	12-15-05	1315	G	✓						3			3	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

Sample Disposal
☐ Return to Client ☒ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☐ Standard ☒ Rush (Specify) 7 DAY AS PER CONTRACT

QC Requirements (Specify)

1. Relinquished by	Date	Time	1. Received by	Date	Time
Samuel E Jones	12-15-05	2140			
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Laboratory received by	Date	Time

Comments

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp. _____ °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

SHEALY Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
Cayce, South Carolina 29033
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 57080

Client: CH2M Hill	Report to Contact: Dan Tomczak	Telephone No. / Fax No. / E-mail: 919 875-4311 Ext. 19	Quote No.
Address: 3125 Poplarwood Ct. Ste 304	Sampler's Signature: X James E Frank	Waybill No.	Page 1 of 2
City: Raleigh / State: NC / Zip Code: 27604	Printed Name: JAMES E FRANK	Analysis (Attach list if more space is needed.)	
Project Name: SWMU 36Φ			
Project No.: 330653.FI.5G	P.O. No.		Lot No.

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	MeOH	NaOH	5035 Kit	VOC	OLM04	Remarks / Cooler I.D.
SWMU 36Φ-MW09	1-18-06	1750	G	X						9			9		TRIPLICATE FOR MS/MSD
SWMU 36Φ-MW09IW	1-18-06	1840								3			3		
SWMU 36Φ-MW1Φ	1-18-06	1905													
SWMU 36Φ-MW1ΦIW	1-18-06	1905													
SWMU 36Φ-MW1Φ-P	1-18-06	1905													
SWMU 36Φ-FBΦ118Φ6	1-18-06	1925													
SWMU 36Φ-EBΦ118Φ6	1-18-06	1935													
SWMU 36Φ-MW03	1-19-06	0825													
SWMU 36Φ-MW03IW	1-19-06	0840													
SWMU 36Φ-MW01	1-19-06	0935	↓	↓						↓			↓		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☑ Unknown

Sample Disposal
☐ Return to Client ☑ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☑ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: James E Frank	1-19-06	1740	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Laboratory received by		

Comments

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp. _____ °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

SHEALY Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
Cayce, South Carolina 29033
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 57081

Client: CH 2M Hill	Report to Contact: Dan Tomczak	Telephone No. / Fax No. / E-mail: 919-875-4311 Ext. 19	Quote No.
Address: 3125 Poplarwood Ct. St. 304	Sampler's Signature: X James E Frank	Waybill No.	Page 2 of 3
City: Raleigh / State: NC / Zip Code: 27604	Printed Name: JAMES E FRANK	Analysis (Attach list if more space is needed.)	
Project Name: SWMU 36Φ			
Project No.: 330653.FI.JG	P.O. No.		Lot No.

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H_2SO_4	HNO_3	HCl	NaOH	5035 Kit	VOC	O&M Φ4	Remarks / Cooler I.D.
SWMU 36Φ-MWΦ1IW	1-19-Φ6	ΦΦ45	G	X						3			X		
SWMU 36Φ-MWΦ2	1-19-Φ6	1Φ35													
SWMU 36Φ-MWΦ2IW	1-19-Φ6	1Φ5Φ													
SWMU 36Φ-MW12	1-19-Φ6	1135													
~~SWMU~~ 1817-MWΦ1	1-19-Φ6	122Φ													
1817-MWΦ1P	1-19-Φ6	122Φ													
IC78-GW39-Φ6A	1-19-Φ6	1245											2		
SWMU 36Φ-MWΦ7	1-19-Φ6	131Φ													
SWMU 36Φ-MW11	1-19-Φ6	134Φ													
SWMU 36Φ-MWΦ8	1-19-Φ6	142Φ													

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☐ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: James E Frank	1-19-Φ6	1740	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Laboratory received by		

Comments

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp. _____

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

SHEALY **Chain of Custody Record**

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
Cayce, South Carolina 29033
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 57082

Client	Report to Contact	Telephone No. / Fax No. / E-mail	Quote No.
Address	Sampler's Signature	Waybill No.	Page 3 of 3
City / State / Zip Code	X	Analysis (Attach list if more space is needed.)	
Project Name	Printed Name		
Project No. / P.O. No.		voc only	Lot No.

SAME

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	voc only									Remarks / Cooler I.D.
SWMU 360 - MW04	1-19-06	1440	G	X						3			X									
SWMU 360 - MW06	1-19-06	1540	G	X						3			X									
SWMU 360 - MW05	1-19-06	1540	G	X						3			X									
SWMU 360 - EB0119006	1-19-06	1600	G	X						3			X									
TRIP BLANKS				X						2			X									

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

Sample Disposal
☐ Return to Client ☒ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☒ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by [signature]	1-19-06	1740	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Laboratory received by		

Comments

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. ______ °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Project: SWMU 469, SWMU 423, SWMU 43, Camp Lejeune (CTO-100), Jacksonville, North Carolina
Laboratory: Shealy Environmental Services, Inc.
Sample Delivery Group: GL14015
Fraction: Organic
Matrix: Solid
Report Date: 3/8/2006

This analytical quality assurance report is based upon a review of analytical data generated for soil samples. The sample locations, laboratory identification numbers, sample collection dates, sample matrix, and analyses performed are presented in Table 1.

The samples were analyzed for volatile organic compounds and semivolatile organic compounds. The sample analyses were performed in accordance with the procedures outlined in "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997.

All sample analyses have undergone an analytical quality assurance review to ensure adherence to the required protocols. Results have been validated or qualified according to general guidance provided in the Region IV modifications to "Laboratory Data Validation Functional Guidelines for Validating Organic Analyses", USEPA 9/94. This document specifies procedures for validating data generated for CLP analyses. Therefore, the quality control requirements specified in the methods and associated acceptance criteria were also used to evaluate the non-CLP data. The parameters presented on the following page were evaluated.

X	•	Data Completeness
X	•	Chain of Custody Documentation
X	•	Holding Times
X	•	Instrument Performance
X	•	Initial and Continuing Calibrations
X	•	Laboratory and Field Blank Analysis Results
X	•	Surrogate Compound Recoveries
	•	Matrix Spike/Matrix Spike Duplicate Recoveries and Reproducibility
	•	Field Duplicate Analysis Results
X	•	Laboratory Control Sample Results
X	•	Internal Standard Performance
X	•	Qualitative Identification
X	•	Quantitation/Reporting Limits

X - Denotes parameter evaluated.

It is recommended that the data only be used according to the qualifiers presented, and discussed in this report. All other data should be considered qualitatively and quantitatively valid as reported by the laboratory, based on the items evaluated.

Report Approved By:

Shawne M. Rodgers
President

3/9/2009

Date

1.0 *DATA COMPLETENESS*

The data package was complete.

2.0 *CHAIN OF CUSTODY DOCUMENTATION*

The chain of custody documentation was complete.

3.0 *HOLDING TIMES*

All criteria were met. No qualifiers were applied.

4.0 *INSTRUMENT PERFORMANCE*

All criteria were met. No qualifiers were applied.

5.0 *INITIAL AND CONTINUING CALIBRATIONS*

All criteria were met. No qualifiers were applied.

6.0 *LABORATORY AND FIELD BLANK ANALYSIS RESULTS*

All criteria were met. No qualifiers were applied.

7.0 *SURROGATE COMPOUNDS*

All criteria were met. No qualifiers were applied.

8.0 *MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND REPRODUCIBILITY*

The laboratory did not select a site sample to perform matrix spike/ matrix spike duplicate analyses. Therefore, the associated sample data could not be evaluated based on these parameters. This should be noted when assessing the sample data.

9.0 *FIELD DUPLICATE RESULTS*

There was no field duplicate sample submitted with this SDG.

10.0 *LABORATORY CONTROL SAMPLE RESULTS*

All criteria were met. No qualifiers were applied.

11.0 *INTERNAL STANDARD PERFORMANCE*

All criteria were met. No qualifiers were applied.

12.0 *QUALITATIVE IDENTIFICATION*

All criteria were met. No qualifiers were applied.

13.0 *QUANTITATION/REPORTING LIMITS*

As required by USEPA protocol, all compounds, which were qualitatively identified at concentrations below their respective Quantitation Limits (QLs), have been marked with "J" qualifiers to indicate that they are quantitative estimates.

METHODOLOGY REFERENCES

Analysis	Reference
Volatile Organic Compounds	Method 8260B, "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997
Semivolatile Organic Compounds	Method 8270C, "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997

Table 1 Samples For Data Validation Review
SWMU 469, SWMU 423, SWMU 43, Camp Lejeune (CTO-100), Jacksonville, North Carolina
Shealy Environmental Services, Inc. Sample Delivery Group GL14015

SAMPLE I.D.	LABORATORY I.D	DATE COLLECTED	MATRIX	ANALYSES PERFORMED	
				VOA	TOC
SWMU360-IS34-1-3	GL14015-003	12/13/2005	Soil	X	X
SWMU360-IS34-16-18	GL14015-004	12/13/2005	Soil	X	
SWMU360-IS35-1-3	GL14015-005	12/13/2005	Soil	X	
SWMU360-IS35-14-16	GL14015-006	12/13/2005	Soil	X	X
SWMU360-IS45-1-3	GL14015-001	12/13/2005	Soil	X	
SWMU360-IS45-17-19	GL14015-002	12/13/2005	Soil	X	
SWMU360-TB121305	GL14015-007	12/13/2005	Trip Blank	X	

Project: SWMU 469, SWMU 423, SWMU 43, Camp Lejeune (CTO-100), Jacksonville, North Carolina
Laboratory: Shealy Environmental Services, Inc.
Sample Delivery Group: GL15064
Fraction: Organic
Matrix: Aqueous
Report Date: 3/9/2006

This analytical quality assurance report is based upon a review of analytical data generated for soil samples. The sample locations, laboratory identification numbers, sample collection dates, sample matrix, and analyses performed are presented in Table 1.

The samples were analyzed for volatile organic compounds and total organic carbon. The sample analyses were performed in accordance with the procedures outlined in "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997.

All sample analyses have undergone an analytical quality assurance review to ensure adherence to the required protocols. Results have been validated or qualified according to general guidance provided in the Region IV modifications to "Laboratory Data Validation Functional Guidelines for Validating Organic Analyses", USEPA 9/94. This document specifies procedures for validating data generated for CLP analyses. Therefore, the quality control requirements specified in the methods and associated acceptance criteria were also used to evaluate the non-CLP data. The parameters presented on the following page were evaluated.

X	•	Data Completeness
X	•	Chain of Custody Documentation
X	•	Holding Times
X	•	Instrument Performance
X	•	Initial and Continuing Calibrations
X	•	Laboratory and Field Blank Analysis Results
X	•	Surrogate Compound Recoveries
X	•	Matrix Spike/Matrix Spike Duplicate Recoveries and Reproducibility
X	•	Field Duplicate Analysis Results
X	•	Laboratory Control Sample Results
X	•	Internal Standard Performance
X	•	Qualitative Identification
X	•	Quantitation/Reporting Limits

X - Denotes parameter evaluated.

It is recommended that the data only be used according to the qualifiers presented, and discussed in this report. All other data should be considered qualitatively and quantitatively valid as reported by the laboratory, based on the items evaluated.

Report Approved By:

Shawne M. Rodgers
President

3/9/2006
Date

1.0 *DATA COMPLETENESS*

The data package was complete.

2.0 *CHAIN OF CUSTODY DOCUMENTATION*

The chain of custody documentation was complete.

3.0 *HOLDING TIMES*

All criteria were met. No qualifiers were applied.

4.0 *INSTRUMENT PERFORMANCE*

All criteria were met. No qualifiers were applied.

5.0 *INITIAL AND CONTINUING CALIBRATIONS*

All criteria were met. No qualifiers were applied.

6.0 *LABORATORY AND FIELD BLANK ANALYSIS RESULTS*

All criteria were met. No qualifiers were applied.

7.0 *SURROGATE COMPOUNDS*

All criteria were met. No qualifiers were applied.

8.0 *MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND REPRODUCIBILITY*

All criteria were met. No qualifiers were applied.

9.0 *FIELD DUPLICATE RESULTS*

Duplicate samples WMU360-IS37-17-19 and SWMU360-IS37-P-1-3were submitted to the laboratory to evaluate sampling and analytical precision for those organic compounds determined to be present. Results for these duplicate samples are presented in Table 2. Precision is evaluated by calculating the relative percent difference (%RPD) between duplicate pair results. There are no USEPA-established acceptance criteria for field duplicate samples. EDQ uses internal acceptance criteria of twenty percent for volatile detected compounds to evaluate field duplicate samples.

10.0 *LABORATORY CONTROL SAMPLE RESULTS*

All criteria were met. No qualifiers were applied.

11.0 *INTERNAL STANDARD PERFORMANCE*

All criteria were met. No qualifiers were applied.

12.0 *QUALITATIVE IDENTIFICATION*

All criteria were met. No qualifiers were applied.

13.0 *QUANTITATION/REPORTING LIMITS*

As required by USEPA protocol, all compounds, which were qualitatively identified at concentrations below their respective Quantitation Limits

(QLs), have been marked with "J" qualifiers to indicate that they are quantitative estimates.

METHODOLOGY REFERENCES

Analysis	Reference
Volatile Organic Compounds	Method 8260B, "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997
Total Organic Carbon	Walkley-Black

Table 1 Samples For Data Validation Review
SWMU 469, SWMU 423, SWMU 43, Camp Lejeune (CTO-100), Jacksonville, North Carolina
Shealy Environmental Services, Inc. Sample Delivery Group GL15064

SAMPLE I.D.	LABORATORY I.D	DATE COLLECTED	MATRIX	ANALYSES PERFORMED	
				VOA	TOC
SWMU360-EB121405	GL15064-004	12/14/2005	Equipment Blank	X	
SWMU360-EB121405 B	GL15064-010	12/14/2005	Equipment Blank	X	
SWMU360-FB121405	GL15064-008	12/14/2005	Field blank	X	
SWMU360-GW37-22-26	GL15064-007	12/14/2005	Groundwater	X	
SWMU360-GW37-38-42	GL15064-009	12/14/2005	Groundwater	X	
SWMU360-GW41-22-26	GL15064-012	12/14/2005	Groundwater	X	
SWMU360-GW42-22-26	GL15064-011	12/14/2005	Groundwater	X	
SWMU360-IS36-1-3	GL15064-005	12/14/2005	Soil	X	X
SWMU360-IS36-17-19	GL15064-006	12/14/2005	Soil	X	
SWMU360-IS37-1-3	GL15064-001	12/14/2005	Soil	X	
SWMU360-IS37-17-19	GL15064-003	12/14/2005	Soil	X	X
SWMU360-IS37-P-1-3	GL15064-002	12/14/2005	Soil	X	
SWMU360-TB121405	GL15064-013	12/14/2005	Trip Blank	X	

Table 2 Field Duplicate Sample Results for Organic Analyses
Duplicate Samples SWMU360-IS37-1-3 and SWMU360-IS37-P-1-3

	SWMU360-IS37-1-3 (µg/L)	SWMU360-IS37-P-1-3 (µg/L)		RPD	Comments
Tetrachloroethene	8.2	5.9		32.6	
Toluene	6.9	3.40	J	68.0	

Project: SWMU 469, SWMU 423, SWMU 43, Camp Lejeune (CTO-100), Jacksonville, North Carolina
Laboratory: Shealy Environmental Services, Inc.
Sample Delivery Group: GL16009
Fraction: Organic
Matrix: Aqueous
Report Date: 3/8/2006

This analytical quality assurance report is based upon a review of analytical data generated for groundwater samples. The sample locations, laboratory identification numbers, sample collection dates, sample matrix, and analyses performed are presented in Table 1.

The samples were analyzed for volatile organic compounds. The sample analyses were performed in accordance with the procedures outlined in "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997.

All sample analyses have undergone an analytical quality assurance review to ensure adherence to the required protocols. Results have been validated or qualified according to general guidance provided in the Region IV modifications to "Laboratory Data Validation Functional Guidelines for Validating Organic Analyses", USEPA 9/94. This document specifies procedures for validating data generated for CLP analyses. Therefore, the quality control requirements specified in the methods and associated acceptance criteria were also used to evaluate the non-CLP data. The parameters presented on the following page were evaluated.

X	•	Data Completeness
X	•	Chain of Custody Documentation
X	•	Holding Times
X	•	Instrument Performance
X	•	Initial and Continuing Calibrations
X	•	Laboratory and Field Blank Analysis Results
X	•	Surrogate Compound Recoveries
X	•	Matrix Spike/Matrix Spike Duplicate Recoveries and Reproducibility
X	•	Field Duplicate Analysis Results
X	•	Laboratory Control Sample Results
X	•	Internal Standard Performance
X	•	Qualitative Identification
X	•	Quantitation/Reporting Limits

X - Denotes parameter evaluated.

It is recommended that the data only be used according to the qualifiers presented, and discussed in this report. All other data should be considered qualitatively and quantitatively valid as reported by the laboratory, based on the items evaluated.

Report Approved By:

Shawne M. Rodgers
President

3/9/2009

Date

1.0 *DATA COMPLETENESS*

The data package was complete.

2.0 *CHAIN OF CUSTODY DOCUMENTATION*

The chain of custody documentation was complete.

3.0 *HOLDING TIMES*

All criteria were met. No qualifiers were applied.

4.0 *INSTRUMENT PERFORMANCE*

All criteria were met. No qualifiers were applied.

5.0 *INITIAL AND CONTINUING CALIBRATIONS*

All criteria were met. No qualifiers were applied.

6.0 *LABORATORY AND FIELD BLANK ANALYSIS RESULTS*

The positive acetone and 2-butanone results for the sample are qualitatively invalid due to the presence of these compounds in associated laboratory method and/or field blanks. USEPA protocol requires positive results for common contaminants, such as acetone, that are less than or equal to ten times the associated blank contamination level, to be considered qualitatively invalid. Replacing results that are less than the quantitation limit with the quantitation limit has indicated this. Results that are greater than the quantitation limits are marked "U".

7.0 *SURROGATE COMPOUNDS*

All criteria were met. No qualifiers were applied.

8.0 *MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND REPRODUCIBILITY*

All criteria were met. No qualifiers were applied.

9.0 *FIELD DUPLICATE RESULTS*

Duplicate samples SWMU360-GW38-22-26 and SWMU360-GW38-P-22-26 were submitted to the laboratory to evaluate sampling and analytical precision for those organic compounds determined to be present. Results for these duplicate samples are presented in Table 2. Precision is evaluated by calculating the relative percent difference (%RPD) between duplicate pair results. There are no USEPA-established acceptance criteria for field duplicate samples. EDQ uses internal acceptance criteria of twenty percent for volatile detected compounds (and 25 percent for extractable compounds) to evaluate field duplicate samples.

10.0 *LABORATORY CONTROL SAMPLE RESULTS*

All criteria were met. No qualifiers were applied.

11.0 *INTERNAL STANDARD PERFORMANCE*

All criteria were met. No qualifiers were applied.

12.0 *QUALITATIVE IDENTIFICATION*

All criteria were met. No qualifiers were applied.

13.0 *QUANTITATION/REPORTING LIMITS*

As required by USEPA protocol, all compounds, which were qualitatively identified at concentrations below their respective Quantitation Limits (QLs), have been marked with "J" qualifiers to indicate that they are quantitative estimates.

METHODOLOGY REFERENCES

Analysis	Reference
Volatile Organic Compounds	Method 8260B, "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997
Semivolatile Organic Compounds	Method 8270C, "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997

Table 1 Samples For Data Validation Review
SWMU 469, SWMU 423, SWMU 43, Camp Lejeune (CTO-100), Jacksonville, North Carolina
Shealy Environmental Services, Inc. Sample Delivery Group GL16009

SAMPLE I.D.	LABORATORY I.D	DATE COLLECTED	MATRIX	ANALYSES PERFORMED VOA
SWMU360-EB121505	GL16009-005	12/15/2005	Equipment Blank	X
SWMU360-GW38-22-26	GL16009-011	12/15/2005	Groundwater	X
SWMU360-GW38-P-22-26	GL16009-012	12/15/2005	Groundwater	X
SWMU360-GW39-22-26	GL16009-009	12/15/2005	Groundwater	X
SWMU360-GW39-38-42	GL16009-010	12/15/2005	Groundwater	X
SWMU360-GW40-22-26	GL16009-006	12/15/2005	Groundwater	X
SWMU360-GW40-38-42	GL16009-007	12/15/2005	Groundwater	X
SWMU360-GW43-22-26	GL16009-001	12/15/2005	Groundwater	X
SWMU360-GW44-22-26	GL16009-002	12/15/2005	Groundwater	X
SWMU360-GW44-38-42	GL16009-003	12/15/2005	Groundwater	X
SWMU360-GW44-P-38-42	GL16009-004	12/15/2005	Groundwater	X
SWMU360-TB121505	GL16009-008	12/15/2005	Trip Blank	X

Table 2 Field Duplicate Sample Results for Organic Analyses
Duplicate Samples SWMU360-GW38-22-26 and SWMU360-GW38-P-22-26

	SWMU360-GW38-22-26 (µg/L)		SWMU360-GW38-P-22-26 (µg/L)		RPD	Comments
Acetone	20	U	20	U	NC	
cis-1,2-Dichloroethene	1.2	J	1.3	J	8.0	
Ethylbenzene	1.3	J	0.87	J	39.6	
Toluene	0.53	J	0.40	J	28.0	
Trichloroethene	0.59	J	0.58	J	1.7	

Project: SWMU 469, SWMU 423, SWMU 43, Camp Lejeune (CTO-100), Jacksonville, North Carolina
Laboratory: Shealy Environmental Services, Inc.
Sample Delivery Group: HA20024
Fraction: Organic
Matrix: Aqueous
Report Date: 3/8/2006

This analytical quality assurance report is based upon a review of analytical data generated for groundwater samples. The sample locations, laboratory identification numbers, sample collection dates, sample matrix, and analyses performed are presented in Table 1.

The samples were analyzed for volatile organic compounds. The sample analyses were performed in accordance with the procedures outlined in "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997.

All sample analyses have undergone an analytical quality assurance review to ensure adherence to the required protocols. Results have been validated or qualified according to general guidance provided in the Region IV modifications to "Laboratory Data Validation Functional Guidelines for Validating Organic Analyses", USEPA 9/94. This document specifies procedures for validating data generated for CLP analyses. Therefore, the quality control requirements specified in the methods and associated acceptance criteria were also used to evaluate the non-CLP data. The parameters presented on the following page were evaluated.

X	•	Data Completeness
X	•	Chain of Custody Documentation
X	•	Holding Times
X	•	Instrument Performance
X	•	Initial and Continuing Calibrations
X	•	Laboratory and Field Blank Analysis Results
X	•	Surrogate Compound Recoveries
X	•	Matrix Spike/Matrix Spike Duplicate Recoveries and Reproducibility
X	•	Field Duplicate Analysis Results
X	•	Laboratory Control Sample Results
X	•	Internal Standard Performance
X	•	Qualitative Identification
X	•	Quantitation/Reporting Limits

X - Denotes parameter evaluated.

It is recommended that the data only be used according to the qualifiers presented, and discussed in this report. All other data should be considered qualitatively and quantitatively valid as reported by the laboratory, based on the items evaluated.

Report Approved By:

Shawne M. Rodgers
President

3/9/2006

Date

1.0 *DATA COMPLETENESS*

The data package was complete.

2.0 *CHAIN OF CUSTODY DOCUMENTATION*

The chain of custody documentation was complete.

3.0 *HOLDING TIMES*

All criteria were met. No qualifiers were applied.

4.0 *INSTRUMENT PERFORMANCE*

All criteria were met. No qualifiers were applied.

5.0 *INITIAL AND CONTINUING CALIBRATIONS*

All criteria were met. No qualifiers were applied.

6.0 *LABORATORY AND FIELD BLANK ANALYSIS RESULTS*

All criteria were met. No qualifiers were applied.

7.0 *SURROGATE COMPOUNDS*

All criteria were met. No qualifiers were applied.

8.0 *MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND REPRODUCIBILITY*

All criteria were met. No qualifiers were applied.

9.0 *FIELD DUPLICATE RESULTS*

Duplicate sample pairs SWMU360-MW10 and SWMU360-MW10-P, and 1817-MW01 and 1817-MW01-P were submitted to the laboratory to evaluate sampling and analytical precision for those organic compounds determined to be present. Results for these duplicate samples are presented in Tables 2 and 3. Precision is evaluated by calculating the relative percent difference (%RPD) between duplicate pair results. There are no USEPA-established acceptance criteria for field duplicate samples. EDQ uses internal acceptance criteria of twenty percent for volatile detected compounds (and 25 percent for extractable compounds) to evaluate field duplicate samples.

10.0 *LABORATORY CONTROL SAMPLE RESULTS*

All criteria were met. No qualifiers were applied.

11.0 *INTERNAL STANDARD PERFORMANCE*

All criteria were met. No qualifiers were applied.

12.0 *QUALITATIVE IDENTIFICATION*

All criteria were met. No qualifiers were applied.

13.0 QUANTITATION/REPORTING LIMITS

The following samples were analyzed at dilutions. The dilution analyses were performed because of the suspected presence of high levels of target compounds and/or interferences. Quantitation limits are elevated by the dilution factor for these samples for target compounds that were not detected. The elevated quantitation limits should be noted when assessing the data for these samples.

Sample	Dilution Factor
1817-MW01	50.0
1817-MW01-P	50.0

As required by USEPA protocol, all compounds, which were qualitatively identified at concentrations below their respective Quantitation Limits (QLs), have been marked with "J" qualifiers to indicate that they are quantitative estimates.

METHODOLOGY REFERENCES

Analysis	Reference
Volatile Organic Compounds	Method 8260B, "Test Methods for Evaluating Solid Wastes", SW-846, third edition, Promulgated Updates II, IIA, and III, June 1997

Table 1 Samples For Data Validation Review
SWMU 469, SWMU 423, SWMU 43, Camp Lejeune (CTO-100), Jacksonville, North Carolina
Shealy Environmental Services, Inc. Sample Delivery Group HA20024

SAMPLE I.D.	LABORATORY I.D	DATE COLLECTED	MATRIX	ANALYSES PERFORMED VOA
1817-MW01	HA20024-015	1/19/2006	Groundwater	X
1817-MW01-P	HA20024-016	1/19/2006	Groundwater	X
IR78-GW39-06A	HA20024-017	1/19/2006	Groundwater	X
SWMU360-EB011806	HA20024-007	1/18/2006	Equipment Blank	X
SWMU360-EB011906	HA20024-024	1/19/2006	Equipment Blank	X
SWMU360-FB011806	HA20024-006	1/18/2006	Field Blank	X
SWMU360-MW01	HA20024-010	1/19/2006	Groundwater	X
SWMU360-MW01IW	HA20024-011	1/19/2006	Groundwater	X
SWMU360-MW02	HA20024-012	1/19/2006	Groundwater	X
SWMU360-MW02IW	HA20024-013	1/19/2006	Groundwater	X
SWMU360-MW03	HA20024-008	1/19/2006	Groundwater	X
SWMU360-MW03IW	HA20024-009	1/19/2006	Groundwater	X
SWMU360-MW04	HA20024-021	1/19/2006	Groundwater	X
SWMU360-MW05	HA20024-023	1/19/2006	Groundwater	X
SWMU360-MW06	HA20024-022	1/19/2006	Groundwater	X
SWMU360-MW07	HA20024-018	1/19/2006	Groundwater	X
SWMU360-MW08	HA20024-020	1/19/2006	Groundwater	X
SWMU360-MW09	HA20024-001	1/18/2006	Groundwater	X
SWMU360-MW09IW	HA20024-002	1/18/2006	Groundwater	X
SWMU360-MW10	HA20024-003	1/18/2006	Groundwater	X
SWMU360-MW10IW	HA20024-004	1/18/2006	Groundwater	X
SWMU360-MW10-P	HA20024-005	1/18/2006	Groundwater	X
SWMU360-MW11	HA20024-019	1/19/2006	Groundwater	X
SWMU360-MW12	HA20024-014	1/19/2006	Groundwater	X
Trip Blanks	HA20024-025	1/12/2006	Groundwater	X

Table 2 Field Duplicate Sample Results for Organic Analyses
Duplicate Samples SWMU360-MW10 and SWMU360-MW10-P

	SWMU360-MW10 (µg/L)		SWMU360-MW10-P (µg/L)		RPD	Comments
Bromodichloromethane	0.50	J	0.54	J	7.7	
Chloroform	1.5	J	1.7	J	12.5	
cis-1,2-Dichloroethene	14		13		7.4	
Tetrachloroethene	9.0		8.8		2.2	
Trichloroethene	3.2	J	3.0	J	6.5	

Table 3 Field Duplicate Sample Results for Organic Analyses
Duplicate Samples 1817-MW01 and 1817-MW01-P

	1817-MW01 (µg/L)		1817-MW01-P (µg/L)		RPD	Comments
Benzene	13	J	ND		NC	
cis-1,2-Dichloroethene	370		ND		NC	
Tetrachloroethene	3100		3200		3.2	
Trichloroethene	200	J	190.0	J	5.1	